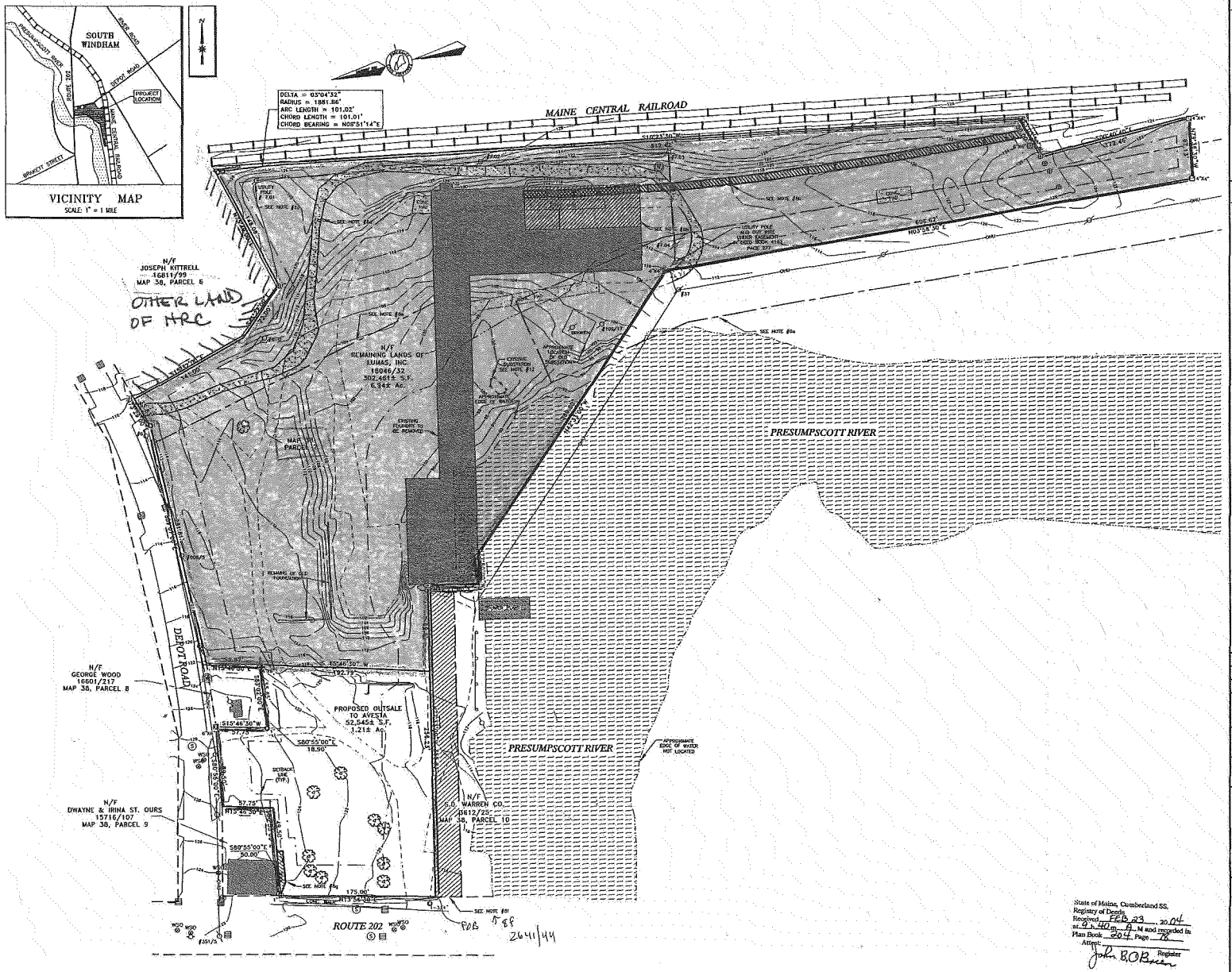
VIL_RESP03509

2331324.1

Exhibit A

VIL_RESP03510



LEGEND

- FOUND IRON PIN (SIZE AS NOTED)
- FOUND IRON ROD (SIZE AS NOTED)
- FOUND CONCRETE MONUMENT (SIZE AS NOTED)
- FOUND GRANITE MONUMENT (SIZE AS NOTED)
- FOUND DRILL HOLE
- UTILITY POLE (NUMBER AS NOTED)
- FOUND DECIDUOUS TREE
- BOUNDARY LINE
- EASEMENT LINE
- EDGE OF WATER
- EDGE OF GRAVEL
- EDGE OF PAVEMENT
- RIGHT-OF-WAY LINE
- OHU — OVERHEAD UTILITY
- 123 — EXISTING CONTOUR

NOTES

1. THE BASIS OF BEARING FOR THIS SURVEY IS 1969 MAGNETIC NORTH.
2. DEED AND PLAN BOOK REFERENCES ARE TO THE CUMBERLAND COUNTY REGISTRY OF DEEDS (CCRD).
3. RECORD OWNERSHIP OF THE PARCEL SURVEYED CAN BE FOUND IN A DEED FROM PRESUMPSCOT/PINEOAK LLC AND GEORGE WOOD TO LUMAS, INC. DATED SEPTEMBER 6, 2002 AND RECORDED IN DEED BOOK 18046, PAGE 32, CCRD.
4. REFERENCE IS MADE TO THE FOLLOWING PLANS:
   a. "GEORGE WOOD SITE AND EXPLORATION LOCATION PLAN" BY S.W. COLE ENGINEERING, INC. DATED JANUARY 11, 1996 AND REVISED APRIL 30, 1996;
   b. "PLAN OF LAND IN SOUTH WINDHAM FOR GRINNELL CORPORATION" BY OWEN HASKELL DATED DECEMBER 1969;
   c. "PLAN OF LAND IN SOUTH WINDHAM FOR GRINNELL COMPANY INC." BY OWEN HASKELL DATED JULY 14, 1969;
   d. "PLAN OF LAND IN SOUTH WINDHAM FOR NATIONAL METAL CONVERTERS" BY OWEN HASKELL, INC. DATED JUNE 19, 1974.
   e. "PLAN OF CONVEYANCE OF PROPERTY AND EASEMENTS FROM LAWRENCE J. KEDDY TO SCOTT PAPER CO. – S.D. WARREN CO. DIVISION" BY LAWRENCE ROLFE DATED 1974 AND RECORDED IN PLAN BOOK 102, PAGE 34 CCRD.
5. THE PARCEL SURVEYED IS IDENTIFIED ON THE TOWN OF WINDHAM TAX ASSESSOR'S MAP 38, PARCEL 7.
6. THE PARCEL SURVEYED IS LOCATED IN THE INDUSTRIAL ZONE/DISTRICT. PORTIONS OF BULK AND SPACE REQUIREMENTS ARE AS FOLLOWS:
   MINIMUM FRONT SETBACK= 35'
   MINIMUM SIDE AND REAR SETBACK= 15'
   MINIMUM WATER SETBACK= 100'
   MINIMUM LOT SIZE= 80,000 SQUARE FEET
7. THE WIDTH AND LAYOUT OF ROADS IS FROM NOTE #4a.
8. REFERENCE IS MADE TO THE FOLLOWING EASEMENTS OF RECORD:
   a. 100' STRIP OF LAND TO ERECT, REPAIR, REBUILD, OPERATE AND PATROL ELECTRIC TRANSMISSION LINES. DEED BOOK 1787 PAGE 354 CCRD. NO LENGTH STATED.
   b. MAINTENANCE OF 823' OF TRACK #7 AND A PERMIT TO OPERATE OVERHEAD CRANES OVER TRACK #7. DEED BOOK 3455 PAGE 305 CCRD. NO WIDTH STATED.
   c. UTILITY POLE EASEMENT POLE NUMBERS 7.01-7.04 DEED BOOK 4098, PAGE 280 CCRD. NO WIDTH STATED.
   d. A RIGHT IN COMMON WITH OTHERS SO ENTITLED TO PASS AND REPASS OVER, ACROSS AND ALONG EXISTING ROADWAY, AS A MEANS OF ACCESS TO THE ELECTRIC TRANSMISSION LINE AND SUPPORTING POLES. DEED BOOK 4162, PAGE 277 CCRD. NO DIMENSIONS STATED.
   e. THE RIGHT PERPETUALLY TO MAINTAIN SAID POLES/LINES DEED BOOK 1758, PAGE 348 CCRD. NO WIDTH STATED.
   f. RIGHT OF WAY 30' IN WIDTH AND 370' IN LENGTH TO BENEFIT THE PROPERTY. DEED BOOK 2841, PAGE 44 CCRD.
   g. AN EASEMENT TO RECOGNIZE EXISTING ENCROACHMENTS ALONG THE NORTHERLY LINE. DEED BOOK 15464, PAGE 323 CCRD.
9. THIS SURVEY EXCEPTS CHAPTER 90, PART 2, SECTIONS 4-7 OF THE MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS RULES.
10. THE PARCEL SHOWN IS SUBJECT TO THE RIGHT OF CENTRAL MAINE POWER COMPANY, ITS SUCCESSORS AND ASSIGNS, TO OVERFLOW AND FLOOD BY MEANS OF ITS DAM AS SET FORTH IN DEED BOOK 2167, PAGE 245 CCRD.
11. PARCEL SHOWN SUBJECT TO THE OWNER OF THE DAM TO ENTER UPON PARCEL FOR THE PURPOSE OF CONSTRUCTING, OPERATING AND MAINTAINING ITS SAID DAMS. ALSO SUBJECT TO THE RIGHT TO PASS AND REPASS FOR ANY AND ALL PURPOSES TO AND FROM DEPOT STREET TO ITS DAM CONSTRUCTED AT LITTLE FALLS ALONG SUITABLE AND CONVENIENT RIGHTS OF WAY.
12. THE EXISTING SUBSTATION WHICH APPEARS NO LONGER IN USE DOES NOT LIE WITHIN THE EASEMENT. ADDITIONAL RESEARCH INTO THIS MATTER IS RECOMMENDED.

PROJECT: 25530	DRAWING NAME: 25530.DWG
DATE: NOVEMBER 6, 2003	SCALE: 1"=50'
REVISED DATE: N/A	COMMENTS: N/A

Project Name and Location:

EXISTING CONDITIONS PLAN OF KEDDY MILL

ROUTE 202 WINDHAM, MAINE

Owner:

LUMAS, INC.
7 DEPOT STREET WINDHAM, MAINE

Prepared For:

LSH HOLDINGS AVESTA
P.O. BOX 470 CUMBERLAND, MAINE 04021

SURVEYING ENGINEERING LAND PLANNING
Northeast Civil Solutions
INCORPORATED
153 US ROUTE 1, SCARBOROUGH, MAINE 04074
tel 207.883.1000 800.882.2227
fax 207.883.1001
e-mail ncs@maine.rr.com

0 50' 100' 200'

STAMP AND SIGNATURE

SEAL

2/20/2004
DATE

M. EDWARD BEDMAN
MAINE P.L.S. 1314

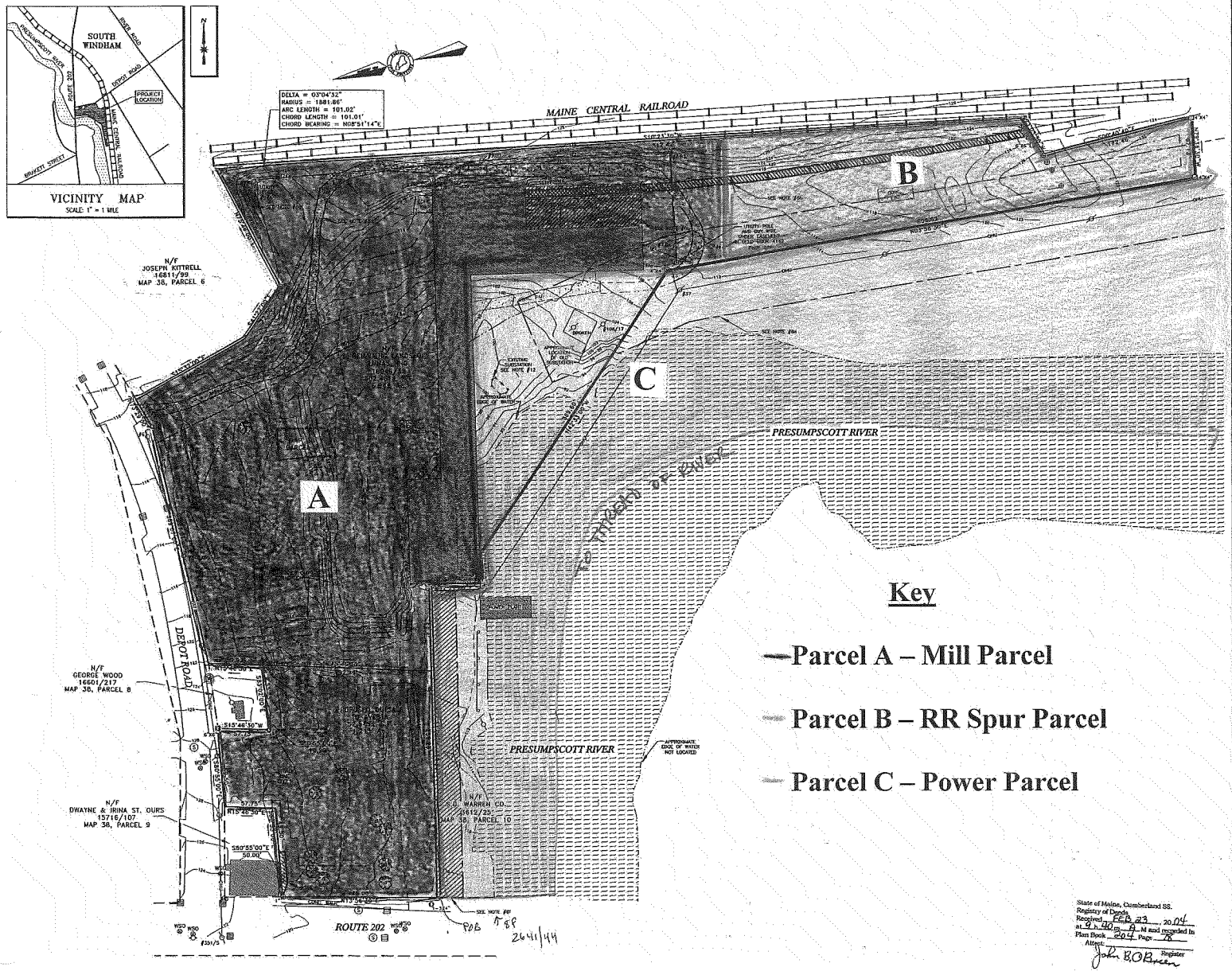
IF THIS PLAN DOES NOT CONTAIN AN EMBOSSED SEAL, IT IS NOT AN ORIGINAL AND MAY BE VOID.

EMBOSSED SEAL ABOVE

State of Maine, Cumberland SS.
Registry of Deeds
Received FEB 23, 20 04
at 2 h. 40 m. P M and recorded in
Plan Book 204 Page 78
Attest: John B. O'Brien Register

Exhibit B

VIL_RESP03511



Key

Parcel A – Mill Parcel

Parcel B – RR Spur Parcel

Parcel C – Power Parcel

State of Maine, Cumberland SS.
Registry of Deeds
Received FEB 23, 2004
at 2 h. 40 m. P.M and recorded in
Plan Book 204 Page 78
Attest: John B. O'Brien, Register

LEGEND

- FOUND IRON PIN (SIZE AS NOTED)
- FOUND IRON ROD (SIZE AS NOTED)
- FOUND CONCRETE MONUMENT (SIZE AS NOTED)
- FOUND GRANITE MONUMENT (SIZE AS NOTED)
- FOUND DRILL HOLE
- UTILITY POLE (NUMBER AS NOTED)
- FOUND DECIDUOUS TREE
- BOUNDARY LINE
- EASEMENT LINE
- EDGE OF WATER
- EDGE OF GRAVEL
- EDGE OF PAVEMENT
- RIGHT-OF-WAY LINE
- OHU — OVERHEAD UTILITY
- 123 — EXISTING CONTOUR

NOTES

1. THE BASIS OF BEARING FOR THIS SURVEY IS 1983 MAGNETIC NORTH.
2. DEED AND PLAN BOOK REFERENCES ARE TO THE CUMBERLAND COUNTY REGISTRY OF DEEDS (CCRD).
3. RECORD OWNERSHIP OF THE PARCEL SURVEYED CAN BE FOUND IN A DEED FROM PRESUMPSCOT/PHOENIX LLC AND GEORGE WOOD TO LUMAS, INC. DATED SEPTEMBER 6, 2002 AND RECORDED IN DEED BOOK 18046, PAGE 32, CCRD.
4. REFERENCE IS MADE TO THE FOLLOWING PLANS:
   a. "GEORGE WOOD SITE AND EXPLORATION LOCATION PLAN" BY S.W. COLE ENGINEERING, INC. DATED JANUARY 11, 1996 AND REVISED APRIL 30, 1996.
   b. "PLAN OF LAND IN SOUTH WINDHAM FOR GRINNELL CORPORATION" BY OWEN HASKELL DATED DECEMBER 1969.
   c. "PLAN OF LAND IN SOUTH WINDHAM FOR GRINNELL COMPANY INC." BY OWEN HASKELL DATED JULY 14, 1969.
   d. "PLAN OF LAND IN SOUTH WINDHAM FOR NATIONAL METAL CONVERTERS" BY OWEN HASKELL, INC. DATED JUNE 19, 1974.
   e. "PLAN OF CONVEYANCE OF PROPERTY AND EASEMENTS FROM LAWRENCE J. KEDDY TO SCOTT PAPER CO. – S.D. WARREN CO. DIVISION" BY LAWRENCE ROLFE DATED 1974 AND RECORDED IN PLAN BOOK 102, PAGE 34 CCRD.
5. THE PARCEL SURVEYED IS IDENTIFIED ON THE TOWN OF WINDHAM TAX ASSESSOR'S MAP 38, PARCEL 7.
6. THE PARCEL SURVEYED IS LOCATED IN THE INDUSTRIAL ZONE/DISTRICT. PORTIONS OF BULK AND SPACE REQUIREMENTS ARE AS FOLLOWS:
   MINIMUM FRONT SETBACK= 35'
   MINIMUM SIDE AND REAR SETBACK= 15'
   MINIMUM WATER SETBACK= 100'
   MINIMUM LOT SIZE= 60,000 SQUARE FEET
7. THE WIDTH AND LAYOUT OF ROADS IS FROM NOTE #4b.
8. REFERENCE IS MADE TO THE FOLLOWING EASEMENTS OF RECORD:
   a. 100' STRIP OF LAND TO ERECT, REPAIR, REBUILD, OPERATE AND PATROL ELECTRIC TRANSMISSION LINES. DEED BOOK 1787 PAGE 334 CCRD. NO LENGTH STATED.
   b. MAINTENANCE OF 873' OF TRACK #7 AND A PERMIT TO OPERATE OVERHEAD CRANES OVER TRACK #7. DEED BOOK 3459 PAGE 305 CCRD. NO WIDTH STATED.
   c. UTILITY POLE EASEMENT POLE NUMBERS 7.01–7.04 DEED BOOK 4096, PAGE 286 CCRD. NO WIDTH STATED.
   d. A RIGHT IN COMMON WITH OTHERS SO ENTITLED TO PASS AND REPASS OVER, ACROSS AND ALONG EXISTING ROADWAY, AS A MEANS OF ACCESS TO THE ELECTRIC TRANSMISSION LINE AND SUPPORTING POLES. DEED BOOK 4182, PAGE 277 CCRD. NO DIMENSIONS STATED
   e. THE RIGHT PERPETUALLY TO MAINTAIN SAID POLES/LINES DEED BOOK 1759, PAGE 348 CCRD. NO WIDTH STATED.
   f. RIGHT OF WAY 30' IN WIDTH AND 370' IN LENGTH TO BENEFIT THE PROPERTY. DEED BOOK 2541, PAGE 44 CCRD.
   g. AN EASEMENT TO RECOGNIZE EXISTING ENCROACHMENTS ALONG THE NORTHERLY LINE. DEED BOOK 15464, PAGE 323 CCRD.
9. THIS SURVEY EXCEPTS CHAPTER 90, PART 2, SECTIONS 4–7 OF THE MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS RULES.
10. THE PARCEL SHOWN IS SUBJECT TO THE RIGHT OF CENTRAL MAINE POWER COMPANY, ITS SUCCESSORS AND ASSIGNS, TO OVERFLOW AND FLOOD BY MEANS OF ITS DAM AS SET FORTH IN DEED BOOK 2107, PAGE 245 CCRD.
11. PARCEL SHOWN SUBJECT TO THE OWNER OF THE DAM TO ENTER UPON PARCEL FOR THE PURPOSE OF CONSTRUCTING, OPERATING AND MAINTAINING ITS SAID DAMS, ALSO SUBJECT TO THE RIGHT TO PASS AND REPASS FOR ANY AND ALL PURPOSES TO AND FROM DEPOT STREET TO ITS DAM CONSTRUCTED AT LITTLE FALLS ALONG SUITABLE AND CONVENIENT RIGHTS OF WAY.
12. THE EXISTING SUBSTATION WHICH APPEARS NO LONGER IN USE DOES NOT LIE WITHIN THE EASEMENT. ADDITIONAL RESEARCH INTO THIS MATTER IS RECOMMENDED.

PROJECT: 25530	DRAWING NAME: 25530.DWG
DATE: NOVEMBER 6, 2003	SCALE: 1"=50'
REVISED DATE: N/A	COMMENTS: N/A

Project Name and Location:
EXISTING CONDITIONS PLAN OF KEDDY MILL
ROUTE 202 WINDHAM, MAINE

Owner:
LUMAS, INC.
7 DEPOT STREET WINDHAM, MAINE

Prepared For:
LSH HOLDINGS AVESTA
P.O. BOX 470 CUMBERLAND, MAINE 04021

SURVEYING ENGINEERING LAND PLANNING
Northeast Civil Solutions
INCORPORATED
153 US ROUTE 1, SCARBOROUGH, MAINE 04074
tel 207.883.1000 800.882.2227
fax 207.883.1001
e-mail ncs@maine.rr.com

0 50 100 200

STAMP AND SIGNATURE

SEAL

2/20/2004
M. JOSHUA BRADBURY DATE
MAINE P.L.S. 1214

IF THIS PLAN DOES NOT CONTAIN AN EMBOSSED SEAL, IT IS NOT AN ORIGINAL AND MAY BE VOID.

EMBOSSED SEAL HERE

EXISTING CONDITIONS SURVEY \ PROJECT 25530 \ NORTHEAST CIVIL SOLUTIONS, INC.

APPENDIX B

PHOTOGRAPHS

PHOTO #1.1 oct 023.jpg	Keddy Mill: View from the south, looking at South Wall. West side Building is taller portion at left. Note water elevation to bottom of grade beam.

PHOTO #1.2 oct 050.jpg	Keddy Mill: View from northwest. West side building (three story) is at right. Note that water flows downslope from the left of the photo and pours into the building near a vehicle door at left side of West building.

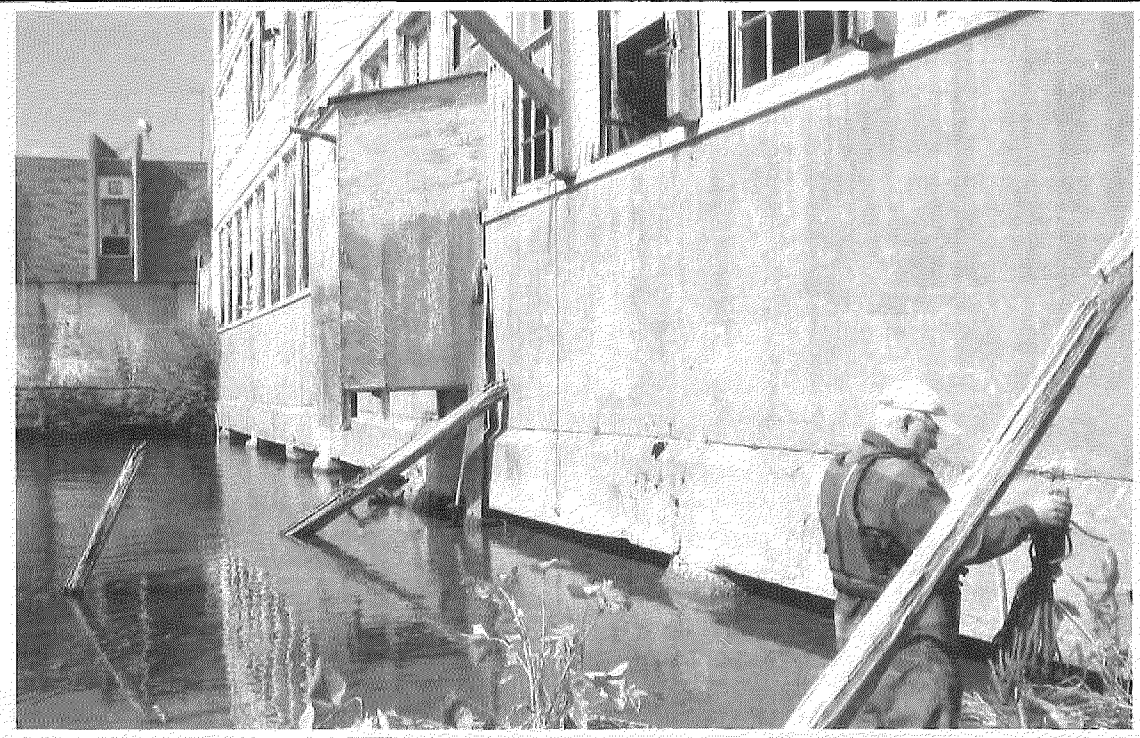


PHOTO #1.3 923 072.jpg	South Elevation, looking West: Piers visible above waterline at 24 foot spacing. During this visit, water depth was 12 inches below bottom of grade beam.

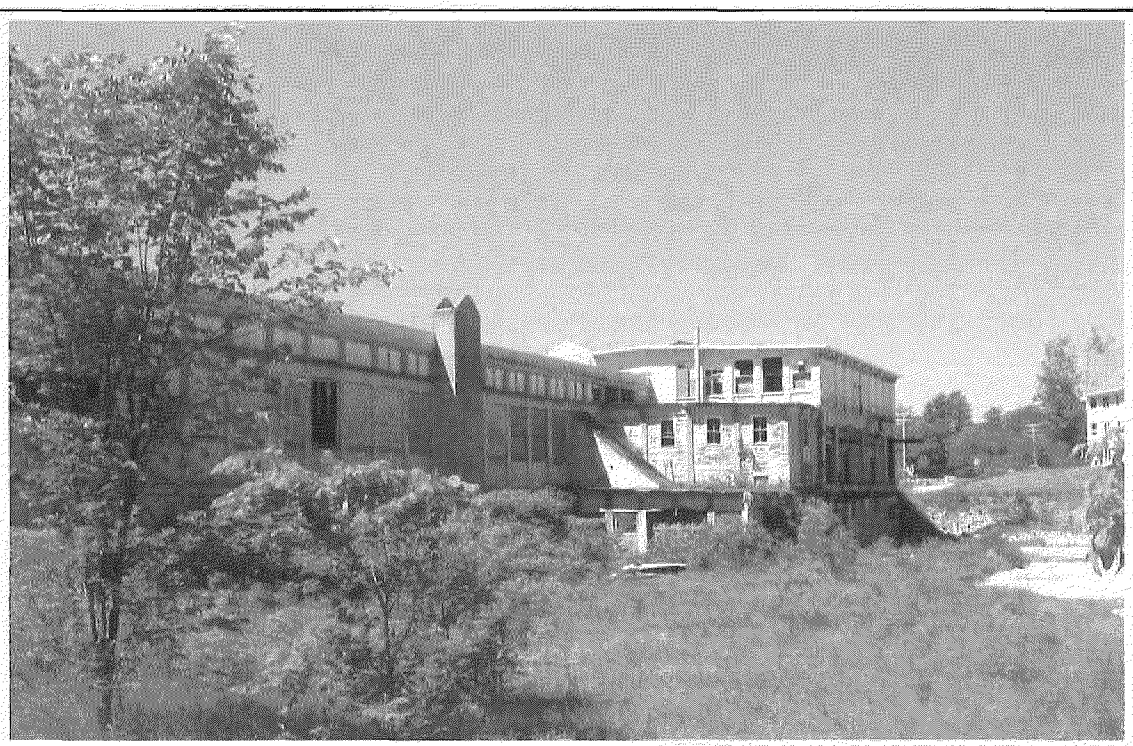


PHOTO #1.4 923 021.jpg	North Elevation, looking West: Large area of fill brought in at this side of the building.

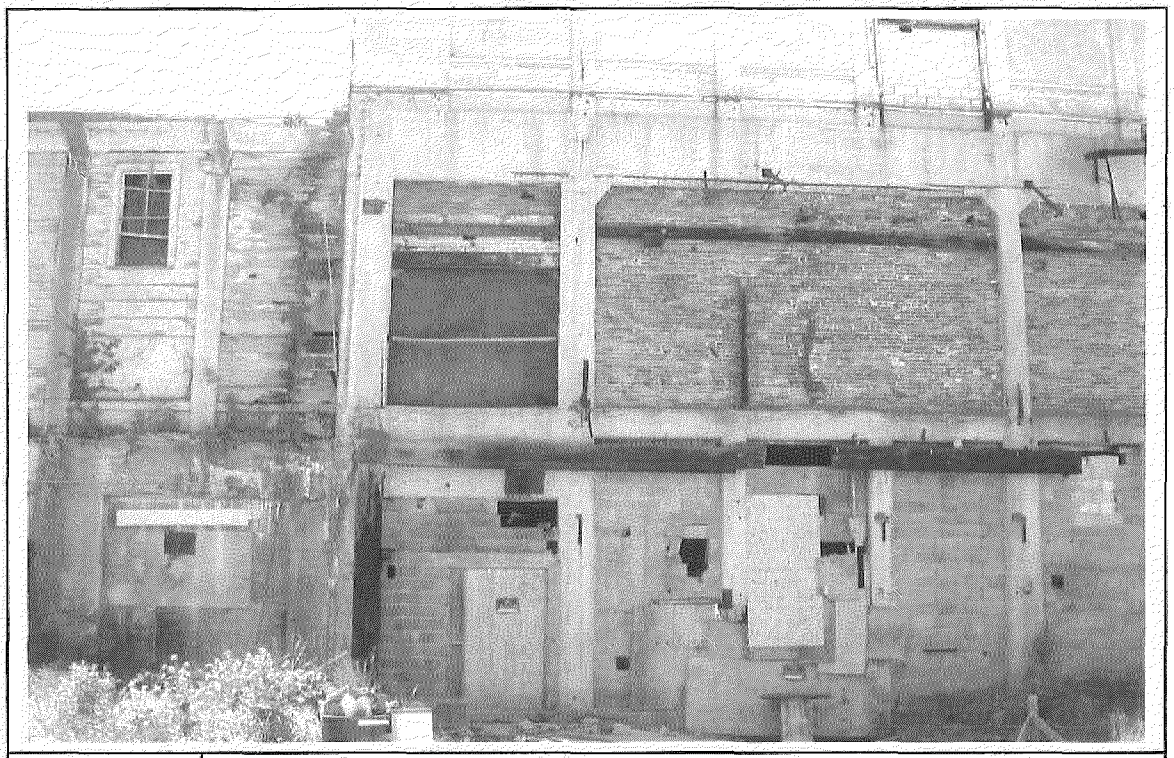


PHOTO #1.5 613 027 jpg	North Wall Detail at West Side Building: Plywood Sheathing indicates area of vehicular entrance. See photo below for runoff draining into building.

PHOTO #1.6 930 007 jpg	Detail at West Building, North Wall: Runoff draining into building from site. Water is running down a cast-in-place concrete vehicular ramp entering the building.

VIL_RESP03515

PHOTO #1.7 930 003.jpg	South Wall, East End: Vehicle Entrance. Note that ledge is very close to ground surface and slab at this end of structure.

PHOTO #1.8 930 003.jpg	Detail: Groundwater height fluctuation at South Wall, Grid Line 27. Note that water elevation in this photo is approximately 2 feet higher than in previous site visit one week earlier.

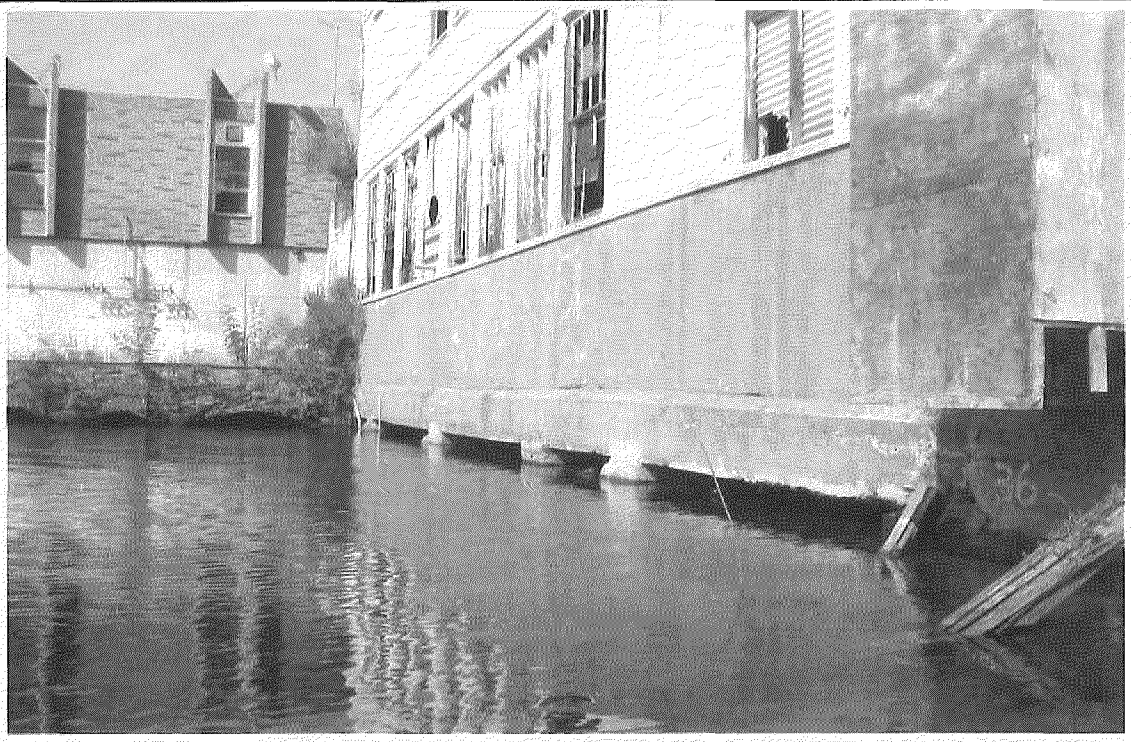


PHOTO #2.1 923-001.jpg	Keddy Mill, South Wall: Piers, Grade Beams, and Foundation Wall along South Wall, from Grid line 36 to grid line 47. Water depth limited access only to line 40.

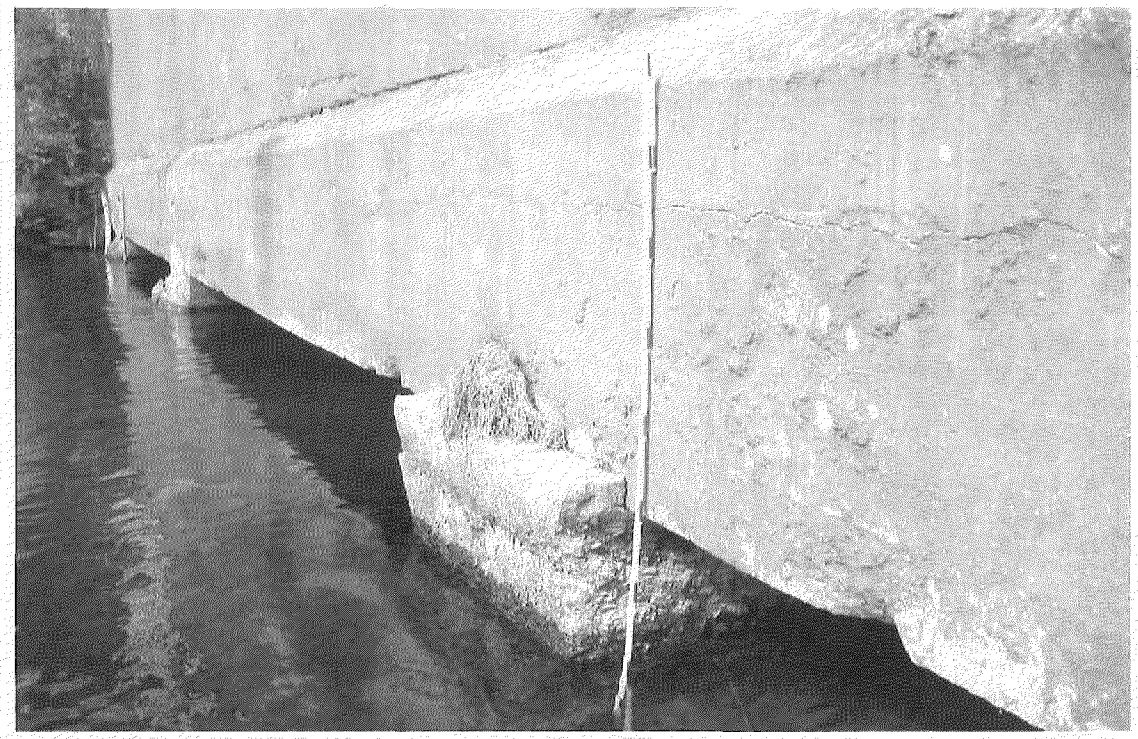


PHOTO #2.2 923-032.jpg	Detail: South Wall Pier at Line 40: Note horizontal grade beam crack. Pier is surrounded by a rotten wooden cofferdam visible in the water to the left of the pier. 12" clearance, water to bottom of grade beam.

PHOTO #2.3 923-042.jpg	South Wall Pier, Line 40: Cofferdam at left, possible original formwork 2'-3" below water surface at right (arrow) may indicate bottom of Pier.

PHOTO #2.4 923-046.jpg	South Wall, looking North: View of elevated slab underside. Pier 40 at left. Note flat slab to Pier 40, then slab-beam system from Column line 40 west to Column line 47.

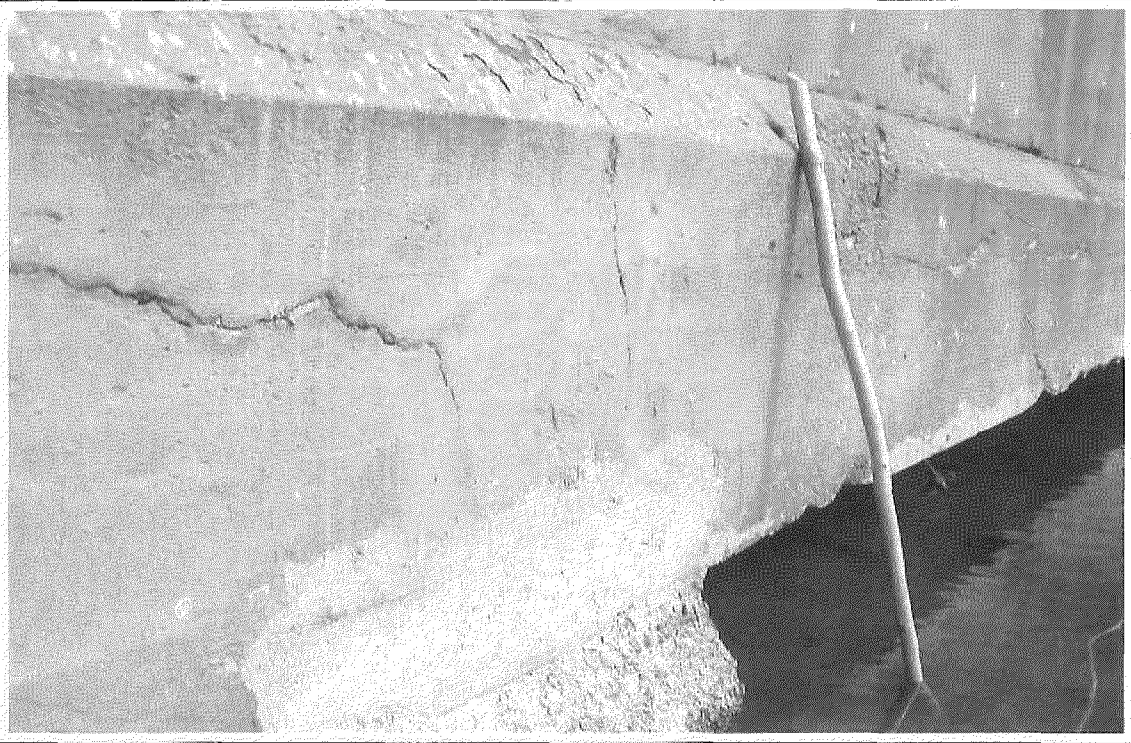


PHOTO #2.5 923 026.jpg	South Wall Grade Beam at Pier 39: Note cracking at left of photo, and crack beyond wading stick at right.

PHOTO #2.6 923 048.jpg	South Wall Underside of Grade Beam, Looking from Line 36 to 39: Spalled concrete reveals structural steel plates, possibly the underside of wide-flange beams encased in concrete. Repair necessary. Cathodic protection possible.

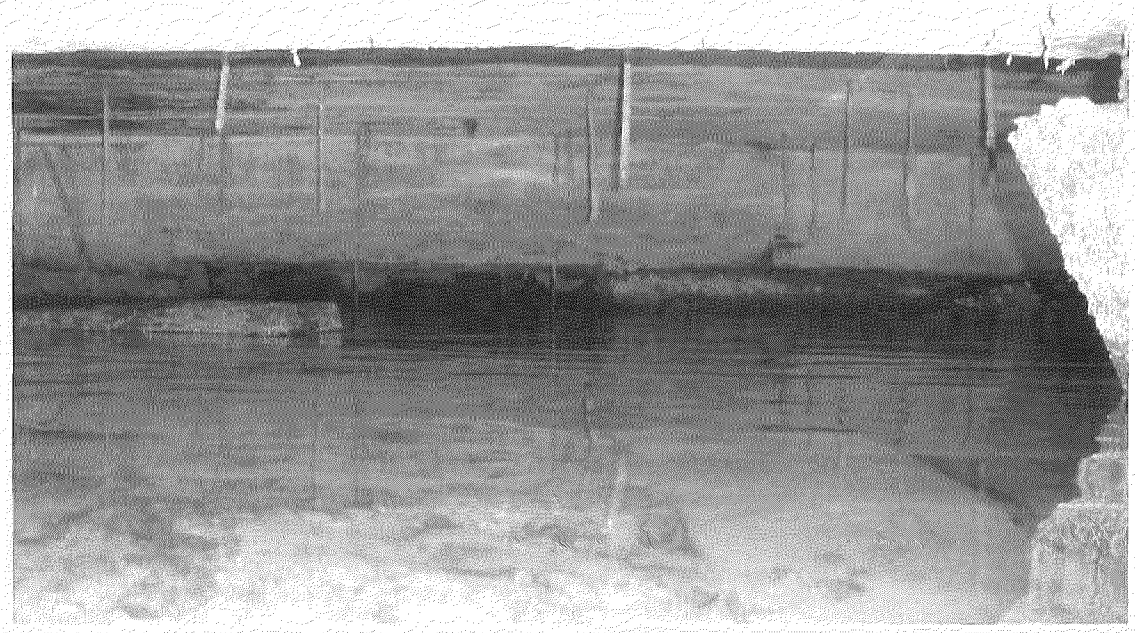


PHOTO #2.7 923 045.jpg	South Wall: Slab Underside at Line 39: Note flat slab supported by grade beam and pier along interior line of framing.

PHOTO #2.8 923 010.jpg	South Wall Pier at Line 36: Note Cracking and Spalling of Concrete. Piece of bent metal at left partially obstructs view of grade beam. Repair required.

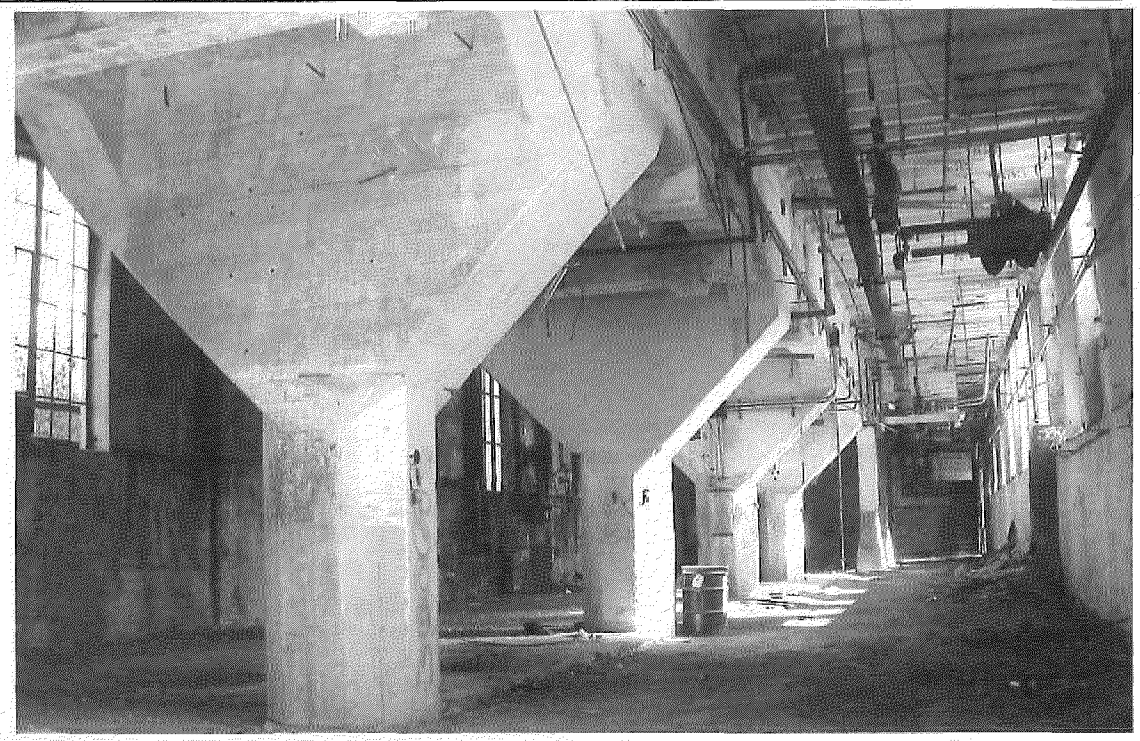


PHOTO #3.1 oct 002.jpg	Keddy Mill, Basement: Proposed Parking Area. Note South Foundation Wall at Right. Columns on top of foundation wall can be braced across to center beam above triangular pier.

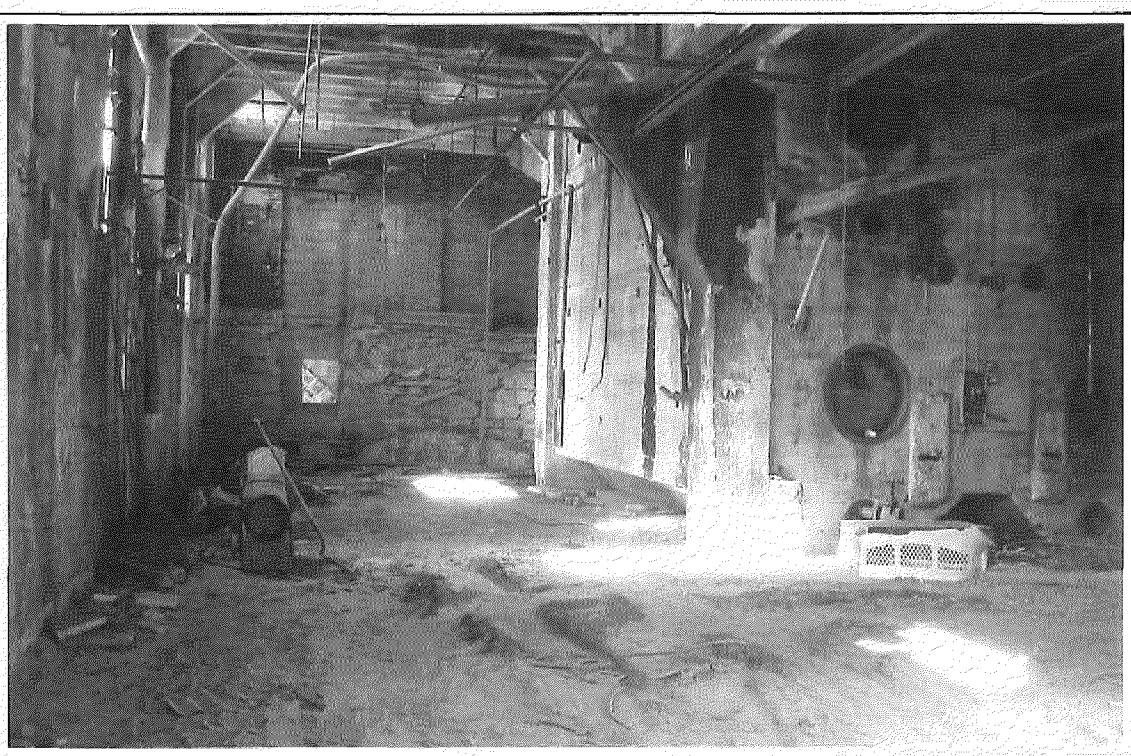


PHOTO #3.2 923 032.jpg	Detail: Looking Toward West Retaining Wall: Rubble and brick are in poor condition, and should stabilized. This wall should be supplemented and/or demolished and rebuilt. Also note thick silt deposits on elevated concrete slab.

PHOTO #3.3 sc 002.jpg	North Wall Core: Core taken from north wall for material evaluation. This concrete core had a compressive strength of 5138 psi.

PHOTO #3.4 sc 004.jpg	South Wall, Core at Line 40: Core taken at Line 40 for materials evaluation. Concrete core tested at 4026 psi.

VIL_RESP03522

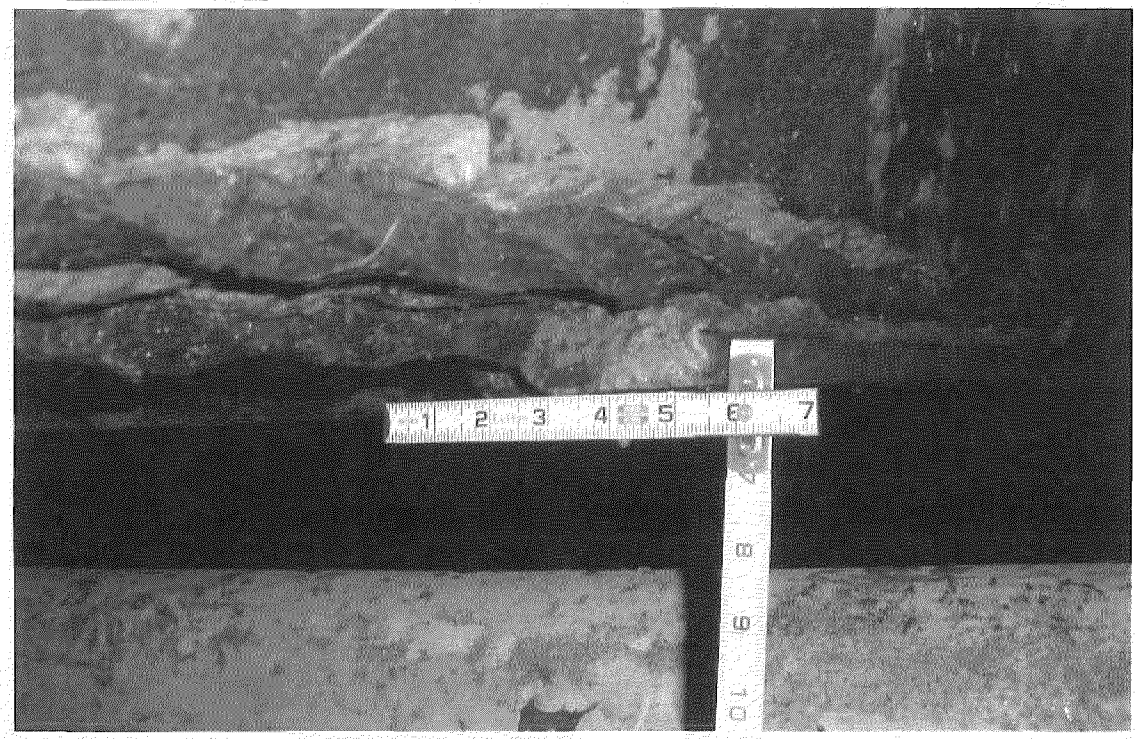


PHOTO #3.5 1019-026.jpg	West side Building Concrete Beam below slab: Note spalled concrete and exposed steel "twisted square" rebar. Concrete repairs will be significant under this slab.

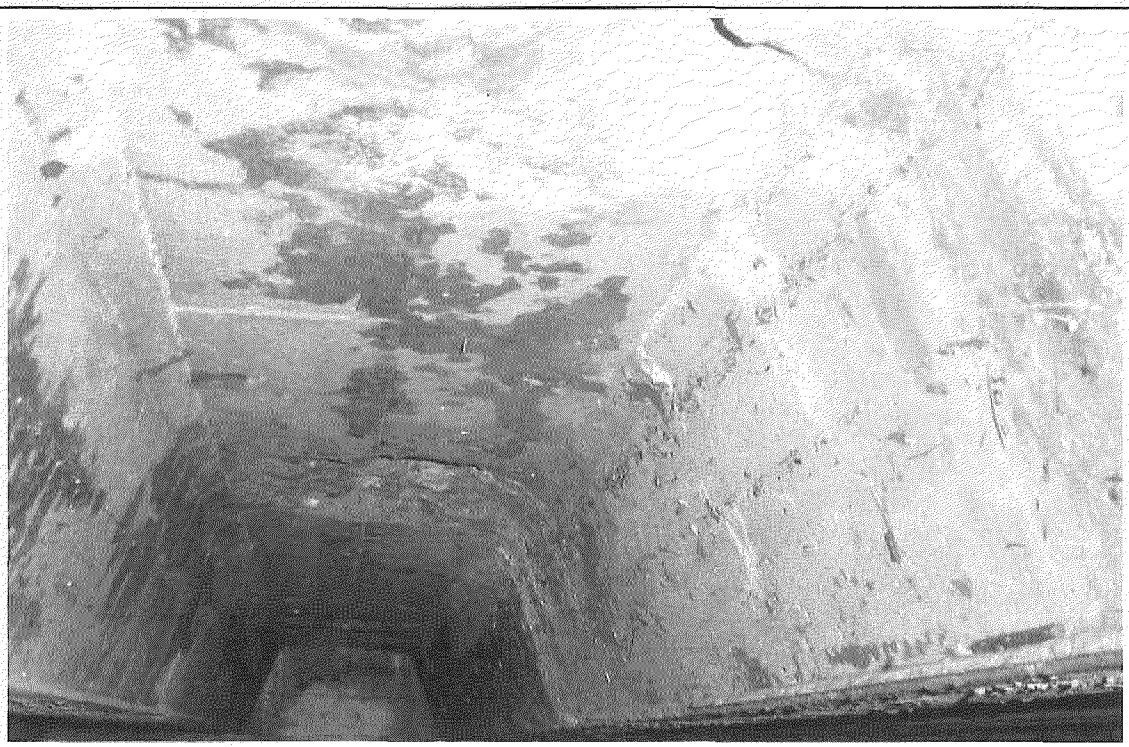


PHOTO #3.6 1019-014.jpg	Underside of slab near Grid Line 43 and Grid Line B. Though not visible, small cracks exist along the length of many of the interior beams.

VIL_RESP03523

PHOTO #3.7 923 045.jpg	B-Line Grade Beam, Looking East toward Line 40: Hanging anchors that supported slab formwork are visible long after formwork was removed or rotted away; Grade Beam visible at right.

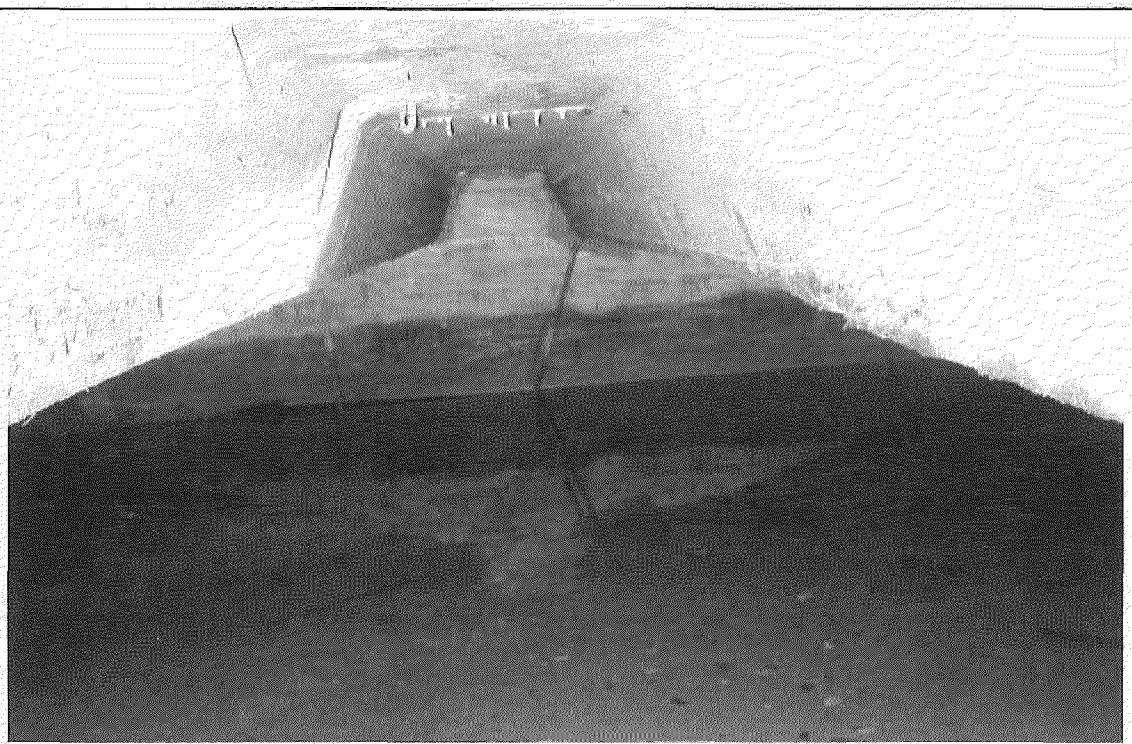


PHOTO #3.8 923 010.jpg	West End, Looking from Line D to Line C near Column Line 43: Note Shallower water depth, this area.

PHOTO #4.1 1107 005.jpg	Keddy Mill: South Wall Excavation at Pier 24.

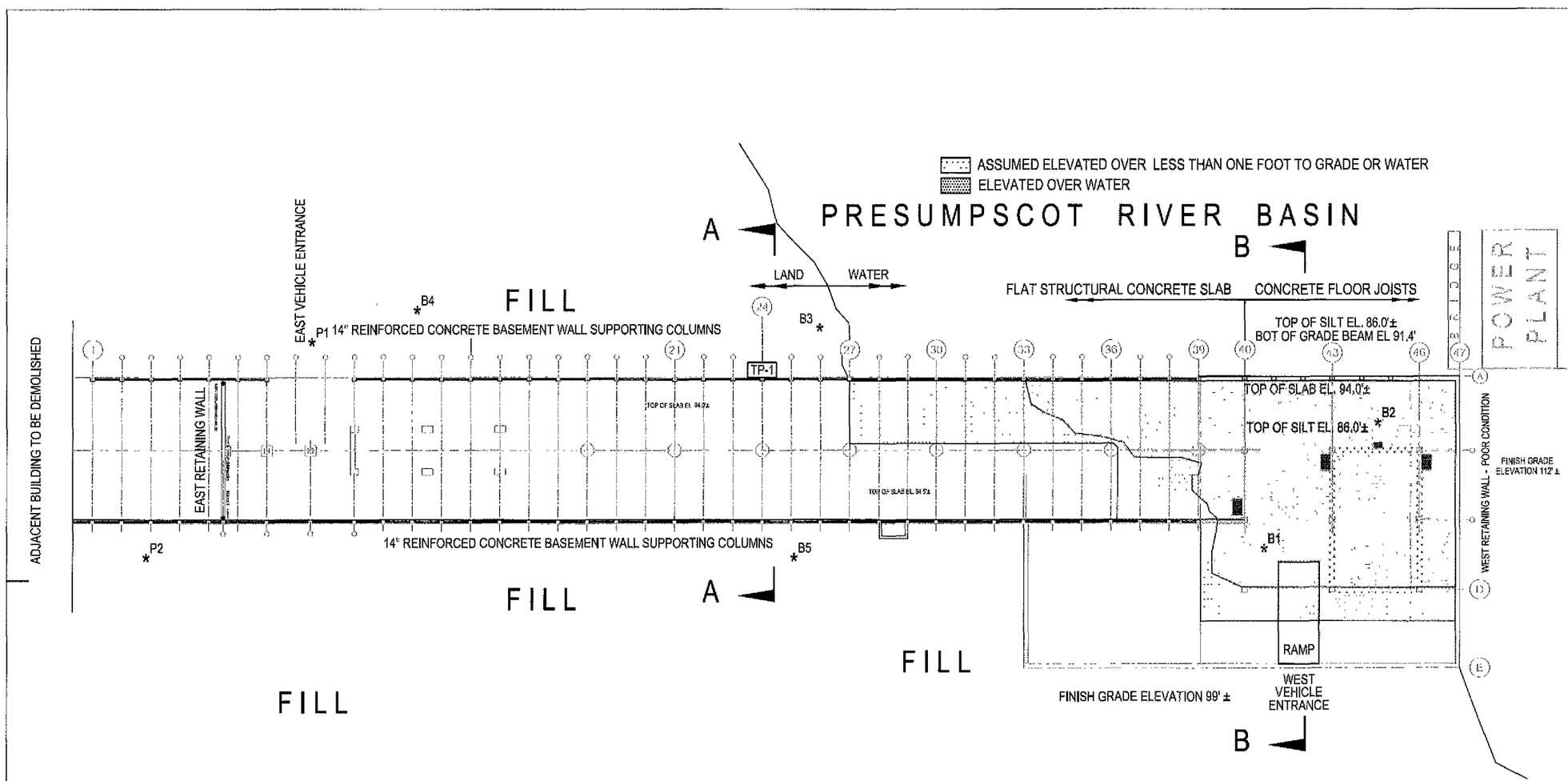
PHOTO #4.2 1107 006.jpg	Keddy Mill: Fill excavated from South Wall Excavation at Pier 24

PHOTO #4.5 1107-022.jpg	South Wall Excavation at Pier 24: Note loose fill in excavation.

PHOTO #4.6 1107-027.jpg	South Wall Excavation at Pier 24: Completed excavation backfilled with existing material. Note that top of fill is approximately at the top of the grade beam at line 24.

APPENDIX A

SCHEMATIC FOUNDATION DRAWINGS



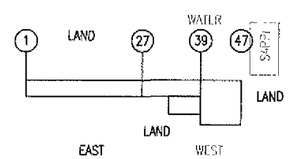
SCHEMATIC SITE PLAN

1/32" = 1'-0" AT 11x17

SYMBOL KEY

* SUMMIT BORING OR PROBE

SLAB ACCESS HOLE



VIL_RESP03528

DRAWING NUMBER
S 1
SHEET 1 OF 4

RESURGENCE
ENGINEERING & PRESERVATION, INC.
132 BRENTWOOD STREET
PORTLAND, ME 04103
V/F (207) 773-4880
RESURGENCE@MYFAIRPOINT.NET

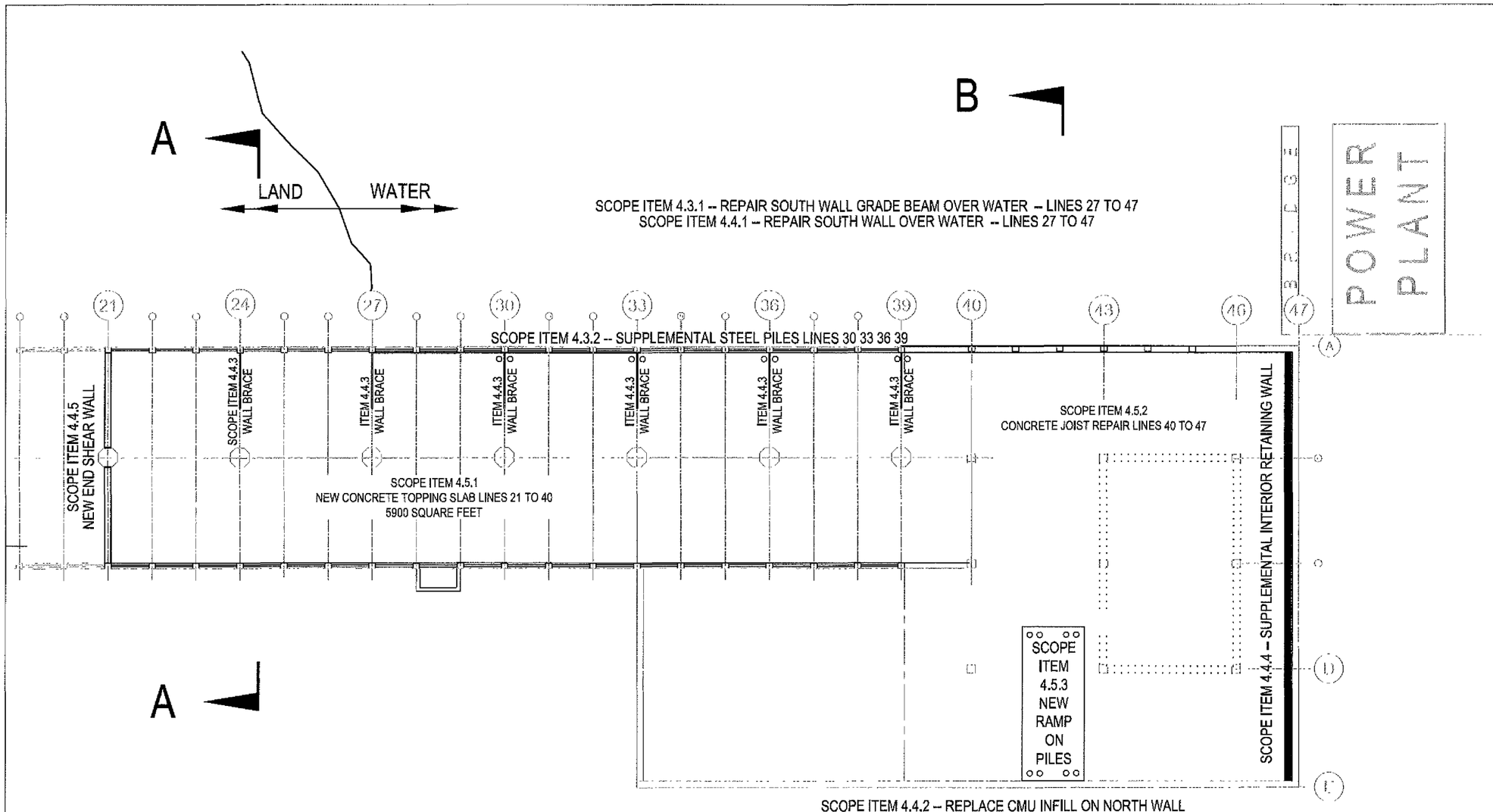
CLIENT: NORTHEAST CIVIL SOLUTIONS
153 U.S. ROUTE 1
SCARBOROUGH, ME 04074

DATE	SCALE:
10 FEB 09	AS NOTED
DRAWN BY: A. HODSON	CHECKED BY: A. HODSON
PROJECT NUMBER: 08-027	CAD FILE: LITTLE FALLS.DWG

PE STAMP -- ENGINEER OF RECORD

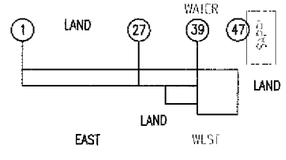
STATE OF MAINE
ALFRED H. HODSON III
No. 9246
LICENSED PROFESSIONAL ENGINEER

PROJECT:
KEDDY MILL FDN ASSESSMENT
SOUTH WINDHAM, ME



SCHEMATIC PLAN - MAJOR REPAIRS

1" = 20'-0" AT 11x17



RESURGENCE
ENGINEERING & PRESERVATION, INC.
132 BRENTWOOD STREET
PORTLAND, ME 04103
V/F (207) 773-4880
RESURGENCE@MYFAIRPOINT.NET

CLIENT: NORTHEAST CIVIL SOLUTIONS
153 U.S. ROUTE 1
SCARBOROUGH, ME 04074

DATE: 10 FEB 09	SCALE: AS NOTED
DRAWN BY: A. HODSON	CHECKED BY: A. HODSON
PROJECT NUMBER: 08-027	CAD FILE: LITTLE FALLS.DWG

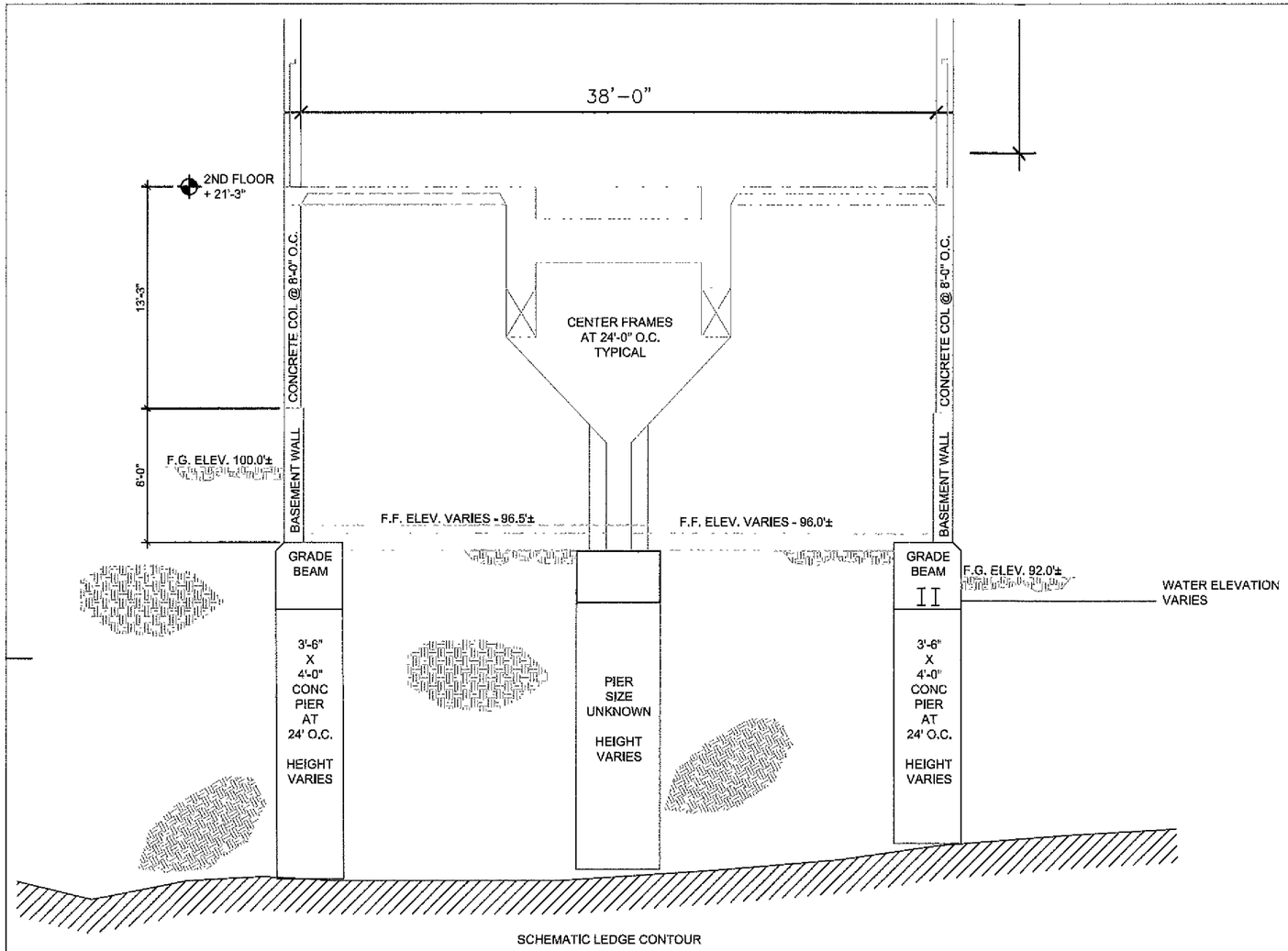
PE STAMP - ENGINEER OF RECORD

STATE OF MAINE
ALFRED H. HODSON III
No. 9246
PROFESSIONAL ENGINEER
LICENSED

PROJECT:
KEDDY MILL FDN ASSESSMENT
SOUTH WINDHAM, ME

VIL_RESP03529

DRAWING NUMBER
S 2
SHEET 2 OF 4



A SCHEMATIC BUILDING SECTION A NEAR LINE 25

1/8" = 1'-0" AT 11x17

RESURGENCE
ENGINEERING & PRESERVATION, INC.
132 BRENTWOOD STREET
PORTLAND, ME 04103
V/F (207) 773-4880
RESURGENCE@MYFAIRPOINT.NET

CIVIL: NORTHEAST CIVIL SOLUTIONS
153 U.S. ROUTE 1
SCARBOROUGH, ME 04074

DATE	SCALE
10 FEB 09	AS NOTED
DRAWN BY	CHECKED BY
A. HODSON	A. HODSON
PROJECT NUMBER	CAD FILE
08-027	LITTLE FALLS.DWG

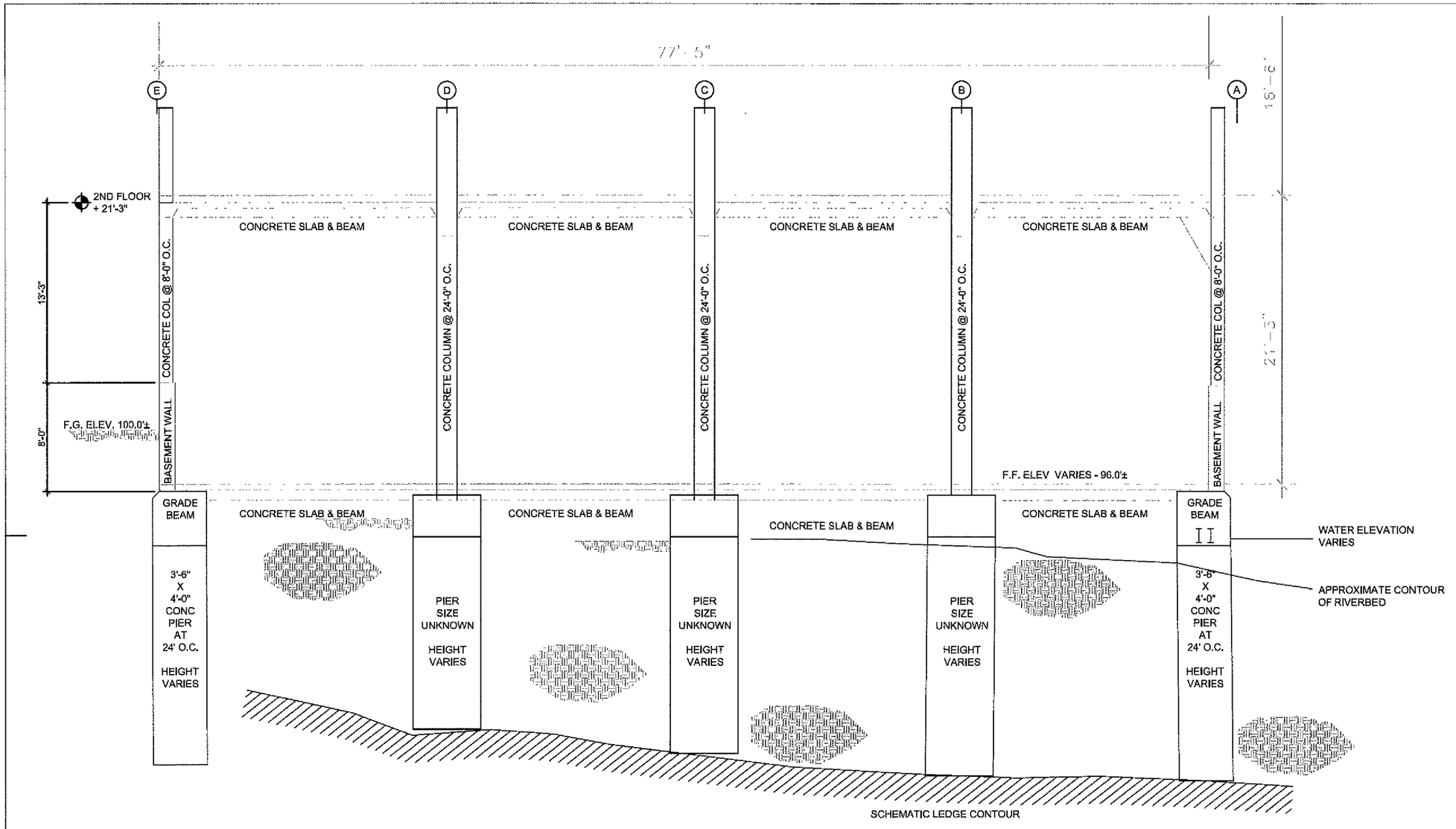
P.E. STAMP --- ENGINEER OF RECORD

STATE OF MAINE
ALFRED H.
HODSON III
No. 9246
LICENSED
PROFESSIONAL ENGINEER

PROJECT:
KEDDY MILL FDN ASSESSMENT
SOUTH WINDHAM, ME

VIL_RESP03530

DRAWING NUMBER
S 3
SHEET 3 OF 4



B SCHEMATIC BUILDING SECTION B NEAR LINE 43

1/8" = 1'-0" AT 11x17

RESURGENCE
ENGINEERING & PRESERVATION, INC.
132 BRENTWOOD STREET
PORTLAND, ME 04103
V/F (207) 773-4880
RESURGENCE@MYFAIRPOINT.NET

CIVIL
NORTHEAST CIVIL SOLUTIONS
153 U.S. ROUTE 1
SCARBOROUGH, ME 04074

DATE: 10 FEB 09	SCALE: AS NOTED
DRAWN BY: A. HODSON	CHECKED BY: A. HODSON
PROJECT NUMBER: 08-027	CAD FILE: LITTLE FALLS.DWG

PE STAMP -- ENGINEER OF RECORD

STATE OF MAINE
ALFRED H. HODSON III
No. 9246
LICENSED PROFESSIONAL ENGINEER

PROJECT
KEDDY MILL FDN ASSESSMENT
SOUTH WINDHAM, ME

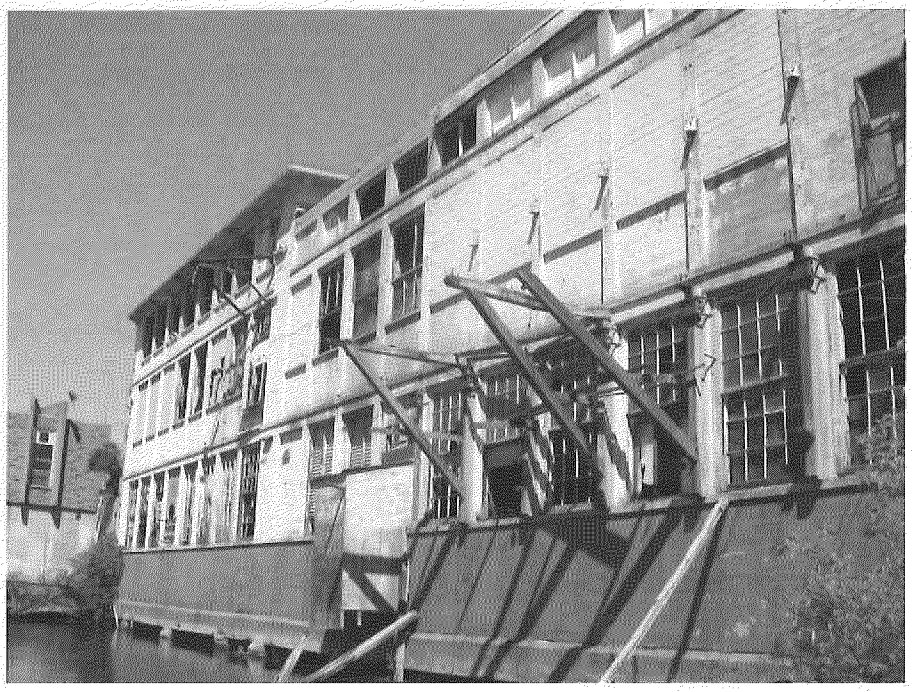
VIL_RESP03531

DRAWING NUMBER
S 4
SHEET 4 OF 4

Foundation Assessment and Seismic Review
Keddy Mill, South Windham, ME
Resurgence engineering project number 08-027

performed for

Northeast Civil Solutions
153 U.S. Route 1
Scarborough, ME 04074



Final Report
February 11, 2009

Resurgence
Engineering and Preservation, Inc.

132 Brentwood Street
Portland, Maine 04103
v/f (207) 773-4880
resurgence@verizon.net

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

Summary:

The foundation structure at the Keddy Mill in South Windham is in good to fair condition, considering age and construction type. Water, sun, and ice have taken a toll on the lower-level concrete slabs and grade beams, causing corrosion, frost heaving, undermining, and distortion.

Though we reference eastern portions of the longer mill building in this report, the project work area considers the mill portions west of column line "21" as shown on Schematic Plans included in Appendix A.

As is often the case with building rehabilitation projects, many factors need to be considered. Economic justification, planning issues, site safety, usage patterns, and environmental issues all factor into the final decision about the best way to improve the property in question. Some rehabilitation items, although not immediately necessary to restore, repair, or replace, may need to be addressed earlier to avoid repeating or complicating future work.

The study area consists of two buildings. The eastern building measures approximately 143' x 38' clear inside. Two floors of housing could be placed in the upper story (10,868 gross square feet), and the rehabilitated parking level could reasonably accommodate approximately 12 cars. The western structure measures approximately 73 feet by 76 feet clear inside. Two upper floors can accommodate approximately 11,096 gross square feet of housing. Parking space in this structure would be limited to two vehicles, due to the incoming vehicle ramp and the large existing boiler that is currently assumed to remain in place.

We believe that foundation repairs to this structure will cost approximately $885,500. This figure considers a 10 percent construction contingency on $700,000 worth of subcontractor work and 15 percent General Contractor Overhead and Profit on top of the subcontractor work plus contingency. It does not consider design fees, construction administration fees, or testing and inspection fees related to this work. It also assumes that this work is part of a much larger construction project, and that these structural repairs are a relatively minor component to that large-scale scope of work, thereby reducing general conditions costs.

While zoning requirements will likely dictate the number of parking spaces required for each unit, we could conservatively say that 14 housing units could fit into the given square footage at 1,000 square feet each.

21,900 gross square feet x 0.8 circulation factor = 17,520 square feet

17,520 square feet x 0.85 partition and walls factor = 14,892 square feet net (14, 1,000 sq. ft. units).

Based upon these assumptions, the ***structural*** costs related to obtaining 14 parking spaces and 21,900 gross square feet of housing are approximately $59 per gross square foot of living space, or $63,200.00 per unit considering 14 units.

We have not taken into account construction of other structures, such as ancillary elevator towers, staircases, or site parking amenities required for the number of units that you can fit within the provided space. This does not include necessary finish costs, such as painting, window replacement, and fireproofing, that will be required in the basement space to comply with the requirements of NFPA 101, the Life Safety Code, which is enforced throughout Maine. It also does not include costs for the numerous areas of the existing upper floor that will need to be patched, strengthened and/or infilled in order to safely separate the basement floor from the residential floors above.

Site, Topography, and Subgrade
The mill is sited in a backwater eddy of the Presumpscot River. Prior to construction of the mill, it appears that the existing grades were much lower than they are today, based upon the amount of debris that has been found in fill brought to the site around the land areas of the building perimeter. Below this loose granular fill that contains construction debris, there are native clay deposits, sand strata, and silts that vary in depth to bedrock below.

Lateral Loading Design Issues:
Change in occupancy of this now-vacant structure, and the extent of work that must be performed, currently dictate that the existing structure conform to the requirements of the 2003 International Building Code and/or the 2003 International Existing Building Code. Maine has adopted a statewide building code, to be enacted in 2010, that will be based upon the 2009 IBC. Structural loading should be reviewed for that code when it is implemented because seismic and wind maps will be revised when that code goes into effect.

Gravity loads proposed for this building are of little structural concern, since residential housing loads and light vehicular parking will clearly be less than the heavy industrial loads the building carried in the past. If the long east section of the mill is filled with two levels of housing (it appears that three levels simply would not fit), then a reasonable anticipated amount of live loading could be considered to be 80 pounds per square foot. If conventional lumber framing is used to build the housing inside the existing mill shell, the total dead load from two floors plus an insulated ceiling below the existing roof is approximately 35 psf. The total dead plus live load of 115 psf is far less than the heavy industrial loadings imposed on the structure while it was used as a mill.

Wind loading review conservatively considered the worst-case scenario of wind blowing directly up the Presumpscot River from downstream at a time of low river depth. The applied wind blows against the tallest wall of the building, the south wall. We compared the approximate wind load on the south wall to the corresponding seismic load on that wall for an earthquake in the same direction. The two loads were quite similar in magnitude, with the seismic load being slightly larger due to the presence of an extra floor in that part of the building.

Piers and Visible Grade Beams
Based upon available elevation survey measurements, the building has not experienced significant differential structural settlement, though it appears that there is some subsidence of the building near the "33" and "30" lines. Water levels and visible structural distress along the south wall grade beam indicate settlement, or that the grade beam was not built level. Although the building may have settled, soils below existing foundations are likely consolidated at this time, and future differential settlement should not be large, barring significant long-term changes in river levels.

At least part of the building appears to be founded on concrete piers encased in timber cribbing. To develop a better understanding of the foundation, Summit dug a test pit along the south wall at the "24" line. The depth of the "pilecap" at that location, along with the depth to ledge determined from adjacent test borings, indicates that the building is supported on square piers that bear down to ledge. We could not confirm this construction technique in the river because of water depths.

Grade beams support the exterior foundation walls and columns above. The South wall grade beam, over the Presumpscot River, shows obvious signs of structural distress near the "40" "39", "36", 33", and "30" lines. The South Wall grade beam will require repair and strengthening, and possibly additional support piles. We observed what appears to be exposed structural steel in the grade beam over the Presumpscot

River. The bottom face of this grade beam has experienced spalling and corrosion. Repairs and future corrosion protection perhaps supplemented by impressed current cathodic protection, will be required.

Some of these repair costs offset costs for demolition of the entire existing mill structure in this area. Therefore, the final cost needs to be weighed against the demolition cost for the entire existing structure, and the costs associated with construction of retaining structures to control flooding in the area of the existing building.

Basement Foundation Walls and Slabs

The westernmost retaining wall, closest to the dam, is in poor condition and will require substantial structural strengthening. It will be necessary to build a completely new wall inboard of the existing western wall, using a combination of lateral soil anchors, grade beams, and new piles to properly support it. The massive boiler structure may also prove useful as a means to brace this new inner wall. Keep in mind that the alternative that considers completely demolishing the mill still carries a significant cost associated with stabilizing the existing basement retaining wall. It is likely that that cost exceeds the $250,000 cost included in this estimate because of additional disturbance to the neighboring power plant. As we discussed, that cost was earlier discussed as approaching $450,000.00.

If the eastern mill building is demolished east of the "21" line, there will be a cost associated with providing a new end shearwall at this location. We have carried that cost assuming that it can be tied into the existing concrete columns and pilecaps.

The long east-west basement walls are generally in good condition. However, they will likely require some lateral bracing to help distribute north-south wind and seismic forces because the upper floor structure does not directly brace these walls. Instead, the columns supporting the upper floor rest on top of the wall, providing less lateral stability at the upper floor. Performing this structural upgrade is relatively straightforward.

Floor slabs require substantial repair, in both elevated and on-grade areas. Additionally, it will be necessary to install some sort of vapor barrier on, below, or above the existing slabs to minimize moisture intrusion through the concrete into the garage space. It will be impossible to keep all of the moisture out of the basement space. The best that can be anticipated is a way to mitigate and control moisture.

As a modified approach to our earlier slab repair strategy between lines 21 and 40, we are now considering placing a new structural slab on top of the existing. This will help increase the vapor permeability of the overall garage space, level the slab heights between the north and south halves of the long mill building, and provide a better finish on the garage floor.

2.0 INTRODUCTION

At the request of Lee Allen of Northeast Civil Solutions, (NCS), Resurgence Engineering and Preservation, Inc. (RE&P) performed a structural evaluation and rehabilitation feasibility study for the Keddy Mill Building Foundation in South Windham, Maine. Alfred H. Hodson III, P.E. provided these services and wrote this report, with the assistance of NCS (building spot elevation survey) and Summit Environmental Services (soil testing and concrete testing).

Based upon available information, the building was built in the late 19th or early 20th century. Best estimates by NCS place the concrete mill construction between 1900 and 1913, though an earlier brick mill structure likely existed before that.

In the summer of 2008, Alfred Hodson met with Lee Allen and Steve Etzel to discuss project goals. In September 2008, Alfred Hodson visited the site several times to gather information necessary to assess the building foundation. We agreed that the general scope and intent of the evaluation and of this report is to:

a. Inspect and evaluate accessible portions of the building foundation structure from inside and outside;
b. Review existing geotechnical information on the site and supplement it with soil borings as necessary to determine existing foundation conditions;
c. Test foundation concrete to determine condition and strength;
d. View underside of elevated slab structure that extends over Presumpscot River;
e. Photograph the building structure and façade to document significant features and deficiencies, and provide approximately 30 photos with the report;
f. Meet with NCS to discuss the findings;
g. Submit a draft report for review;
h. Submit two bound original copies and one unbound copy of the report.

Appendix A of this report contains as-built foundation plans based upon available information, showing the structure and deficient framing and foundation areas. Appendix B provides photographs relevant to the report. The report and appendices should be read in their entirety. Some photos shown in the appendices may indicate damage not specifically mentioned in the report.

Inspection began in early September 2008 and continued through November 7, 2008.

On December 12, we met with Steve Etzel to review a report draft and discuss overall project objectives for future development, based on existing site constraints. As a result of that discussion, the final area of work for the project is considered to be all of the mill structure west of the "21" line as indicated on the building plans. Structure east of this point will be demolished. The overall project cost opinion will be modified to eliminate work east of the "21" line.

Resurgence Engineering and Preservation, Inc. performed limited invasive testing of the structure, but in many locations, we were able to closely observe the structure to locate damaged areas.

However, corrosion, or subgrade undermining may exist beneath concealed surfaces that appeared sound or in areas that were not visible during the inspection. This is typical of any older building.

This building shell is currently hampered by the fact that it remains open to weather, sits on water, has no heat, and is subject to freezing from ice below the first floor.

While this report may discuss the presence of potentially hazardous materials, it does not constitute a full assessment for these materials. Prior to any rehabilitation work, we recommend that you make yourselves aware of hazardous materials, including testing for lead, asbestos, other known hazardous materials.

For purposes of this report, the north side of the mill faces Depot Street. The south side faces the river. The west side faces Route 202.

For purposes of this report, a building element or component in *good* condition is performing its intended purpose, needs no repair, or has only a few minor cosmetic imperfections. A building element in *fair* condition shows anticipated signs of wear, but is still sound, or when up to 25 percent of the element needs to be replaced. A building element is considered to be in poor condition when the element no longer performs its intended function, needs major repair or greater than 25 percent replacement, or appears to be on the verge of failure.

3.0 DOCUMENT REVIEW

3.1 ORIGINAL CONSTRUCTION DOCUMENTS

There were no original construction documents available to review.

3.2 PREVIOUS STUDIES

We did not review the building for code compliance relating to architectural, life safety, electrical, mechanical, or hazardous materials.

Previous studies on the property include geotechnical reports by Oak Engineering, and site surveys by Northeast Civil Solutions. As NCS already has that information at their offices, it is not included in this report's appendix.

Oak Engineering performed geotechnical investigation before the adaptive use of the mill buildings was considered, so the information provided does not fully detail subgrade at the immediate mill site. Information gathered from subgrade profiles 1, 1.2, 2, and 3, dated May 2007 indicates that depth to the existing ledge changes substantially along the 386'+/- length of the mill buildings. Ledge depths varied from just below the slab surface at the east end of the mill, to up to 30 feet below the slab surface some 40 feet north of the mill near the junction of the three-story and two-story structures. Resurgence retained Summit Geoengineering to obtain and evaluate soil and ledge conditions immediately adjacent, and, where possible, inside the mill structure.

4.0 OBSERVATION, EVALUATION, RECOMMENDATIONS

4.1 SITE, TOPOGRAPHY, AND SUBGRADE

Observations and Evaluations:

The building site slopes downward to a basin in front of the north side of the buildings, and from the east toward the west. Eddy flow of the Presumpscot river runs directly below the westernmost 200 feet of the building along the south side (Photo #1.1), from column line 47 to column line 27. The current in the water below the mill appeared to flow back toward the west, or toward the power station. The water level varies with seasonal and floodwater control of the nearby dam. During the inspection period, water elevations along the south building wall varied by as much as two feet.

It is anticipated that any work on the Keddy Mill buildings will have to occur with little or no disturbance to the operations at the adjacent Sappi Power Station.

Summit Geoengineering performed soil borings, soil probes, and a test pit to determine soil conditions and ledge depths. Drawing S-1 in Appendix A of this report shows approximate boring, probe, and test pit locations. It also shows the approximate location of the river in relation to the building. An aerial photo in the Summit report also provides graphical information about the site layout. Please note that this aerial image predates the construction of the apartment complex at the corner of routes 202 and Depot Street.

The mill is sited in a backwater eddy of the river. Prior to construction of the mill, the existing grades were much lower than they are today, based upon the amount of debris that has been found in fill brought to the site around and within the building perimeter. Below this loose granular fill that contains construction debris, there are native silt strata, glacial till, and clay deposits that vary in depth to bedrock below.

The building sits over a section of ledge that is highly variable in contour. Near the east side of the structure, ledge is near the bottom of the ground floor slab. Ledge depth increases to nearly 30 feet below the top of the slab at the north side of the building, near column line 25. At the west end of the building, over the Presumpscot River, ledge depth below the floor slab was roughly 20 feet, with local variability.

Grade beams support the continuous exterior foundation wall. Piers (possibly, in some locations, pilecaps) support the foundation wall and grade beam. When excavating along one of the piers to try to locate piles, we could not find any piles, which leads us to conclude that the building is likely constructed on solid concrete piers. The fact that there is up to 10 feet of fill around the building and beneath the slab also supports this conclusion.

The building sits on piers spaced at approximately 24 feet on center over the water in the east-west direction, and at approximately 20 feet on center north-south. We could not determine if pilecaps support the building east of the "27" line, because the grade beams and piles are buried by fill on the outside, and isolated by concrete slabs inside the building. However, large concrete

piers supporting the second floor penetrate the lower floor at 24 foot spacing. It is reasonable to assume that these are either founded on piles or are piers buried directly to ledge.

The site slope to the north of the building drops a significant quantity of rainwater along and into the building (Photo #1.6). Currently, this runoff drains through holes in the lower level slab and into the Presumpscot River. Site regrading and catch basins will be needed to control runoff. Because the final plan for the site is currently unknown, we will not consider these costs as they relate to the building foundation.

If the project proceeds and the building is rehabilitated, it may be likely that runoff from the extensive roof areas will need to be addressed. A forward-thinking architect could possibly incorporate roof runoff control into a green design that uses the runoff water for purposes such as site irrigation.

Recommendations:

- Develop site plan to shed water away from existing building.
- Consider use of roof runoof for "green" design applications.
- Perform other site improvements as dictated by site design and environmental requirements.

4.2 Seismic Design Issues

Observations and Evaluations:

Base seismic forces on a building depend upon the soil type beneath the structure, the building superstructure construction type, the building substructure type, the building occupancy, and the depth below foundations to bedrock. Soil types and depths include loose sands and marine clays, to a depth of between 15 and 26 feet below the finish floor of the building. Summit Geoengineering evaluated seismic subgrade parameters for the building considering the soil information that they gathered at the building site. The depth to ledge and type of fill present allows the seismic site parameters to be lowered from a more conservative site Class E to a site class D. At locations where the foundations bear directly on ledge, the seismic site parameter can be considered site class B.

Section 1614 of the International Building Code requires seismic evaluation for a property if it undergoes a change of occupancy.

Section [EB] 1614.2 Change of Occupancy, states:

[EB] 1614.2 Change of Occupancy. *When a change of occupancy results in a structure being reclassified to a higher seismic use group, the structure shall conform to the seismic requirements for a new structure.*

Exceptions:

1. *Specific detailing provisions required for a new structure are not required to be met where it can be shown an equivalent level of performance and seismic safety contemplated for a new structure is obtained. Such analysis shall*

consider the regularity, overstrength, redundancy and ductility of the structure within the context of the specific detailing provided.

2. *When a change of use results in a structure being reclassified from Seismic Use Group I to Seismic Use Group II and the structure is located in a seismic map area where S_{DS}<0.33, compliance with this section is not required.*

The conversion of the Keddy Mill to a multiunit residential structure does not change the Seismic Use Group of the building. The building, both as factory space and multiunit residential space, is classified by ASCE 7-02 as a Category II structure, which is included in Seismic Use Group I. However, Exception 2 (above), which also negates the requirements of this section, does so when considering a Short-Period Design Spectral Response Acceleration (S_{DS}) of less than 0.33g. At the Keddy Mill, the S_{DS} measures 0.37g. Therefore, it may be prudent to make the existing building conform to the seismic requirements of a new structure. Structural rehabilitation detailing can improve the seismic resistance of the foundation by adding inclined piles that tie into the existing grade beam or piers to increase stability if the underlying soils liquefy.

If the project proceeds, the upper stories of the building can also be strengthened to assist their ability to resist seismic forces. Some of the upper-level strengthening can be integrated into the design of the living spaces. Other strengthening can consist of the inclusion of several steel-framed braces between existing columns along the length of the long east building. Yet another, less invasive method could consist of carbon-fiber wrapping of critical column joints to improve seismic resistance.

While we have reviewed seismic requirements for the building, we have not performed a complete seismic evaluation of the structure. Such an evaluation would cost much more, and should only occur if the building foundations and superstructure appear capable of safely, durably, and economically supporting the rehabilitated building. It is notable that seismic maps have been updated in a manner that slightly reduces ground accelerations in the Portland, Maine area. The slight decreases in acceleration may be enough to significantly impact seismic design requirements for the structure. We have found that to be the case in similar projects in the Portland area.

Recommendations:

- Consider full seismic design requirements in more detail under provisions of building codes enacted at time of design. Discuss these issues with local building officials to gain appropriate approval of design codes early on in the design process.

4.3 Piers/Pilecaps, and Visible Grade Beams

Observations and Evaluations:

Large cast-in-place piers or pilecaps support the south building wall below column lines 47, 46, 43, 40, 39, 36, 33, 30 and 27. We could not determine how much more of the south building wall they support, but we know that the ledge becomes much closer to the surface further to the east. Piers or pilecaps also appear to support the interior columns where the building is constructed over

water. We initially believed that timber piles supported the pilecaps, which in turn supported the grade beams, walls, and floors above.

Summit excavated a south wall "pilecap" at column line 24, to determine the size and number of piles supporting it. The excavation extended to a depth of five feet along the face of the "pilecap" without reaching its bottom (See Photos 4.1 through 4.6). Importantly, we also observed spiked-together lumber cribbing surrounding at least three sides of the "pilecap". Knowing that the depth from top of "pilecap" to ledge at this location is approximately 18 feet, we now believe that the building is constructed on square piers that extend down to ledge, instead of on timber piles. We believe this because the pier size (3'-6" x 4'-0") would not have been large enough to permit installation of a sufficient amount of timber piles to carry the heavy dead loads (nearly 200 kips) anticipated on the pile group, let alone heavy floor loads imposed by the industrial use.

Based upon Summit's calculations for the capacity of the piers, we believe that they are sufficient to carry gravity loads for the building. However, lingering concerns about building movement at the 40, 39, 36, and 33 lines causes us to suggest that additional piles be installed near the south wall piers at these locations. We suggest installing two 40-ton piles at each of the four locations, installed from the inside of the building. Since we also believe the settlement may occur where the depth to bedrock is deepest, we are considering these piles to be slightly longer, 30-foot sections.

The visible grade beams along the south building wall measured approximately 3'-0" high x 4'-0" wide. We observed structural distress at lines 40, 39, 36, and 33 (Photos 2.1, 2.2, 2.5, 2.8). In places, it appears that large steel beams or plates are encased in the concrete grade beam over the water (Photo #2.6). It is unclear whether these beams were used as primary reinforcement, or whether or not they were encased after being used to construct the extensive formwork needed to build the elevated slab.

We were unable to measure the interior grade beams due to the amount of water at the time of the inspections (Photo #2.7, Photo #3.7). What we were able to see of the interior beams were in good condition, and likely need little work.

Recommendations:

4.3.1 Repair south wall grade beam (approximately 167 lineal feet of exposed beam) over water. Due to access, repair prices will be high for this work. 167 feet x 3 feet x $100 per square foot = $50,000.

4.3.2 Install two new 40-ton piles at each of four locations along the south wall, at column lines 40, 39, 36, and 33. Consider two 30-foot long piles at each location with associated concrete removal and repair costs. Each Location: 60 lf piles at $60/lf plus $2,000 demolition + $1,900 concrete repairs and patching per location x 4 locations = $30,000

4.4 FOUNDATION WALLS

Observations and Evaluations:

Concrete foundation walls sit on top of the grade beams. The walls measure approximately seven feet high, and are 12 to 14 inches thick. Where the walls have been cut to install vehicle entrances, we observed steel longitudinal reinforcement in them. The walls show little evidence of significant structural distress over their length, aside from occasional minor cracking. There is some deterioration at the wall construction joints, which is not unusual for a structure of this age and construction type.

Summit extracted core samples of the basement walls in four locations as shown below.

CORE NUMBER	LOCATION	COMPRESSIVE STRENTGTH, f'_c psi	CHLORIDE ION CONTENT ppm
C1	Basement East Wall @ column line 5.5	3788 psi	<80 ppm
C3	Basement North Wall @ column line 21.5	5138 psi	<80 ppm
C6B	Basement South Wall @ column line 40 (2cores)	4026 psi	<80 ppm
C8	North Wall, Outside Column near line 40	4237 psi	Not taken

Based upon our observation of these walls, review of tested compressive strengths, and tested level of chloride ion contents, we believe that they can remain as a critical part of the structure to distribute lateral loads to the grade beams and piers.

The westernmost wall of the building clearly remains from an earlier structure built at the site (Photo #3.2). It is a brick masonry and rubble stone wall, with supplemental cribbing and concrete block masonry. Review and analysis of this wall was not part of our project scope. We believe that this wall is of little structural value by itself, and should be used as a form to construct an inboard cast-in-place concrete wall properly supported by piles and tied back laterally into the existing soil and, possibly, the large boiler structure remaining in the western building.

The easternmost retaining wall at column line 5.5 shows a small amount of undermining. Since it will be demolished, there will be no costs associated with repairs.

Recommendations:

4.4.1 Repair south foundation walls where necessary above grade beams. Limit the number of new openings cut into these walls. Primary repairs will be at the south side of the building over the river. Allow $21,000.

4.4.2 Replace existing CMU infill on north foundation walls between concrete columns at three-story west building. Area 72 feet x 14 feet high x $32 per square foot. Allow $26,000.

4.4.3 Column lines 21 through 39: Periodically brace tops of foundation walls laterally to internal columns supporting second-floor. 6 locations, 2 sides per location, $1,500 per side, total of $18,000.

4.4.4 Build a new retaining wall at the west end of the building, 20 feet high x 76 feet long, supported on piles and tied back into the existing soils. $250,000.

4.4.5 Build a new end wall frame at the "21" line that ties to existing grade beams. $15,000.

4.5 Lower Level Floor

Observations and Evaluation:

The amount of debris along the south wall of the building, along with the silt accumulated at the west building prohibited complete assessment of existing floor slabs (Photo #3.1 and #3.2). A combination of concrete slabs on grade (assumed at the eastern half of the building) minimally-reinforced flat structural slabs (center of the building), and a structural beam and slab system (observed at the western side of the building) support the lower level floors. Soil borings indicate that the slabs were placed upon loose fill brought in to bring the floor height up to the desired level. A structural beam and slab system is built over the Presumpscot River. These three very different floor types behave differently and are subject to varying forces.

One thing that all slab areas have in common is the lack of a true vapor barrier. Because of the lack of a vapor barrier when the buildings were first built, and the prevalence of groundwater and river water at the site, it will be impossible to keep all moisture out of the basement, regardless of what repair tecnniques are attempted. In fact, the simplest solution may be to clean and repair the existing slabs, cover them with a thin layer of drainage mat, sand and a vapor barrier, and install a new slab on top.

Column Lines 5.5 to 21: *While no longer part of the planned project scope, discussion of this area of the floor remains for future reference.* Slab-on-grade concrete serves as the building flooring from the east end of the structure to a point somewhere near the Presumpscot River, around column line "21". This floor has been subjected to frost action in the unheated building, and water and debris collection. The slab has heaved in many areas and may require removal and replacement. Coring revealed multiple topping layers, likely added over the years as original slabs deteriorated. However, its exact condition cannot be determined until significant pressure-washing and review occur.

At the east end of the building, from column line 5.5 to column line 21, we recommend that you remove approximately 4750 square feet of slab (38 feet by 125 linear feet) and replace it with structural slab that is adequate to carry light vehicular traffic. If demolition and excavation reveals sound soils beneath this slab area, another option could be to compact the subgrade and install a slab-on-grade floor that would be less costly. While we initially considered paving the floor, we feel that the tight turning necessary to move cars in and out of parking spaces will quickly damage the pavement. Regardless of which option is pursued, it is likely that slab underdrains will be necessary to remove groundwater that flows along the shallow ledge at this part of the building. *Costs for work between lines 5.5 and 21 are not included in this report.*

Column Lines 21 through 40: A 12" thick unreinforced structural slab supports the first floor from the "40" line back toward the east to column line "21" (Photo #2.4, Photo #2.7, #3.1). The floor area in this central potion of the building measures approximately 5900 square feet (38 feet x 155 feet, less central piers). It appears that this slab is partially undermined or elevated, as voids were visible beneath it, when it was observed from the south wall and from a crawl space near the "40" line. As with the other slabs in the building, it is extensively covered by debris and its exact condition cannot be determined. Between much of the "21" line to the "39" line, the north half of

the slab is approximately 5 to 6 inches higher than the south half of the slab. The entire portion of the slab between lines 21 and 40 could be removed and replaced with a new, level structural slab, supported by a system of intermittent grade beams. The grade beams could tie into the existing concrete piers at the building center and edges.

Column Lines 40 through 47: An elevated concrete slab and beam structure supports the lower level from approximately column line 40 to the west end of the building, at column line 47. Water levels, deep sediment depths, and low clearances prohibited us from viewing most of the structure directly. We were able to crawl down below the slab near grid lines 43-B and 40-C to observe the concrete condition (Photo #3.5 through Photo #3.8). We observed hairline cracking on approximately 30 percent of the individual steel beams, with more extensive cracking in 10 percent of the beams.

Summit extracted a core sample of the basement slab between column lines 43 and 46. The topping slab compressive strength was 4,178 psi, and the beam compressive strength was 4,785 psi. Chloride ion content in the basement slab was less than 80 ppm, which is a very low value that means that the slab concrete is not susceptible to corrosion of the reinforcing steel from within. Corrosion can, however, occur if cracks form that permit water and oxygen to enter the concrete and corrode the steel. The freeze-thaw cycles that occur in this unheated structure that sits over the water have likely caused the visible concrete cracking and steel corrosion.

Based upon our review of tested compressive strengths and tested chloride ion levels, we believe that the beams can be repaired to help distribute floor loads to the grade beams and piers below.

Low clearances, water heights, and sediment depths will make rehabilitation of this floor framing more costly and complicated (Photo #2.4, Photo #3.8). It will likely be necessary to cofferdam and dewater some of the construction areas in order to perform work on the structure, as well as to coordinate timing of the repairs around planned shutdowns of the adjacent power station.

We spoke with a contractor familiar with performing these types of concrete repairs in confined spaces. We discussed that concrete slab and beam repairs would need to occur over portions of an approximately 5,200 square foot area over water of varying depths, with approximately 30 percent of the area requiring concrete repairs. After reviewing the photos, the contractor did not feel that this was an unreasonable scope of work, and that it would not be prohibitively difficult to perform. We were given an order of magnitude cost opinion of approximately $100 per square foot for concrete repairs in these difficult-to-access spaces. Therefore, we recommend that you conservatively carry a budget allowance of $208,000.00 for concrete slab repairs at the west building (40% of 5,200 square feet x $100 per square foot).

The existing ramp in the basement is in poor condition, and will need to be completely demolished and rebuilt. We recommend installing steel piles to support the ramp structure.

Recommendations:

4.5.1 Lines 21 to 40: Strengthen existing slabs at center of building (5,900 square feet) by installing a new structural slab abnd vapor barrier. $52,000.

4.5.2 Lines 40 to 47: Repair tops and undersides of elevated concrete slabs at west building (40 percent of 5,200 square foot floor area); $208,000.

4.5.3 Lines 40 to 47: Demo and Rebuild ramp into garage area; Support on new steel piles. Assume 8 piles at 25 linear feet x $60/lf installed cost. $50,000.

4.6 Second Floor Framing (not included)

Observations and Evaluation:

This report section is not included at this time. Inspection and assessment of the second floor framing will only occur if approved by the client.

Recommendations:

- None at this time.

4.7 Third Floor and Roof Framing (not included)

Observations and Evaluation:

This report section is not included at this time. Inspection and assessment of the third floor and roof framing will only occur if approved by the client.

Recommendations:

- None at this time.

4.8 Hazardous Materials (not included)

Observations and Evaluation:

We did not perform a Phase I Environmental Site Assessment on this property. However, a few specific issues remain worth mentioning regarding the potential presence of hazardous materials in this building. Older buildings commonly contain hazardous materials such as lead paint. Lead paint likely exists on ceilings, wall partitions, and any other painted surfaces. You should assume the presence of lead paint.

We observed what appeared to be asbestos siding on the upper parts of the structure and on the ground at the building perimeter. These materials should be tested and handled appropriately.

Recommendations:

- If project continues, proceed with materials testing performed by qualified testing contractors.

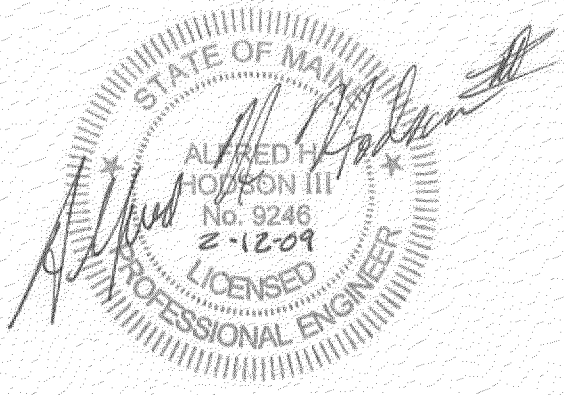
5.0 CONCLUSION

The foundation of the Keddy Mill is in good to fair condition, considering its age and construction type. While there are areas that require repair, the remainder of the foundation appears to be in sufficient condition to warrant salvaging and reuse as foundation and enclosure for parking space and living space above.

We believe that foundation repairs to this structure will cost approximately $885,000. This figure considers a 10 percent construction contingency on $700,000 worth of subcontractor work and 15 percent General Contractor Overhead and Profit on top of the subcontractor work and contingency. It does not consider design fees, construction administration fees, or testing and inspection fees related to this work. Considering fourteen, 1,000 square foot living spaces placed into the building, the totals work out to approximately $59 per square foot, and $63,200 per unit.

If you have any questions, please feel free to contact me. I look forward to walking the site with you to discuss specific aspects of the report.

Sincerely,



Alfred H. Hodson III, P.E.
Resurgence Engineering and Preservation, Inc.

C:\2008jobs\08027 NCS South Windham\vlf keddy mill foundation report.doc (pdf)

VLF STRUCTURAL

RESURGENCE
ENGINEERING AND PRESERVATION, INC.

132 BRENTWOOD STREET
PORTLAND, MAINE 04103
V/F (207) 773-4880
EMAIL: RESURGENCE@MYFAIRPOINT.NET

FINAL REPORT SUBMITTAL AND FINAL INVOICE
FEBRUARY 12, 2009

Northeast Civil Solutions
c/o Lee Allen, P.E.
153 U.S. Route 1
Scarborough, ME 04074

RE: Structural Engineering Review and Assessment: Little Falls Mill Building, South Windham, ME
Resurgence Engineering & Preservation, Inc. Proposal #08-025

Lee,

Please find enclosed a set of the final Little Falls Report, punched for inclusion into the 3-ring binder I provided for you with the draft.

Simply remove the existing draft and Appendix A Drawings from the binder, but keep the remainder of the photos (Appendix B), Geotech Information, and Testing Results (Appendix B).

Add Appendices D and E to the back of the binder.

At Steve's request, I have dropped a copy off directly to him at his office.

I enjoyed working with you and with Steve on this project.

Sincerely,

Alfred H. Hodson III, P.E.

Alfred H. Hodson III, P.E.
AHH/ah
encl: Final Report
Revised Appendix A – Schematic Foundation Drawings
Added Appendix D – Opinion of Probable Foundation Rehabilitation Cost
Added Appendix E – Resurgence Engineering Resume

Final Invoice

Cc: Steve Etzel

c:\2008\08jobs\08027-vlf\cover letter for final report.doc or .pdf

SITE LOCATION OF DEVELOPMENT PERMIT APPLICATION 38 M.R.SA. §§481-490

PLEASE TYPE OR PRINT IN *INK ONLY*

This application is for: (CHECK THE ONE THAT APPLIES)	☐ 20 acre development ☐ Planning Permit ☐ Metallic Mining ☐ Marine Oil Terminal		■ Structure ☐ Subdivision ☐ Major Amendment ☐ Minor Amendment
1. Name of Applicant:	HRC – Village at Little Falls, LLC c/o Steve Etzel	5. Name of Agent: (if applicable)	Northeast Civil Solutions, Inc. c/o Lee Allen
2. Applicant's Mailing Address:	2 Market Street Portland, Maine 04101	6. Agent's Mailing Address:	153 US Route One Scarborough, Maine 04074
3. Applicant's Daytime Phone #:	207-772-7219	7. Agent's Daytime Phone # :	207-883-1000
4. Applicant's Fax #: (if available)	N/A	8. Agent's Fax # and e-mail address:	207-883-1001

PROJECT INFORMATION

9. Name of Development:	Village at Little Falls				
10. Map and Lot #'s:	Map #: 38	Lot #: 6 and 7	11. Deed Reference #'s:	Book #: 20753 and 78353	Page #: 21 and pg 165
12. Location of Project City/Town:	Windham, Maine		13. County:	Cumberland	
14. Brief Description of Project including total parcel size:	The proposed development consists of 85 residential condominium units on an 8.03 acre parcel located on Route 202 in Windham Maine.				
15. Type of Direct Watershed: (Check all that apply)	☐ Lake not most at risk ☐ Lake most at risk ☐ Lake most at risk, severely blooming	■ River, stream or brook ☐ Urban impaired stream ☐ Freshwater wetland	☐ Coastal wetland ☐ Wellhead or public water		
16. Name of Waterbody Project Site drains to:	Presumpscot River				
17. Amount of Developed Area:	Total acres: 8.03	Existing Developed area: 7.83 acres	New Developed area: 7.32 acres		
18. Amount of Impervious Area:	Total acres: 8.03	Existing Impervious areas 1.44 acres	New Impervious area: 4.24 acres		
19. Development started prior to obtaining a license?	☐ Yes ■ No				
20. Development or any portion of the site subject to enforcement action?	☐ Yes ■ No	If yes, name of enforcement staff involved?			
21. Common scheme of development?	☐ Yes ■ No				
22. Natural Resources Protection Act permit required?	■ Yes ☐ No	If yes: ☐ PBR ☐ Tier 1 ■ Full Permit ☐ Tier 2			
23. Existing DEP Permit number (if applicable):	N/A				
24. Names of DEP staff person(s) present at the pre-application meeting:	Mary Beth Richardson and Ben Viola				

CERTIFICATIONS AND SIGNATURES LOCATED ON PAGE 2

VIL_RESP03551

IMPORTANT: IF THE SIGNATURE BELOW IS NOT THE APPLICANT'S SIGNATURE, ATTACH LETTER OF AGENT AUTHORIZATION SIGNED BY THE APPLICANT

By signing below the applicant (or authorized agent), certifies that he or she has read and understood the following :

CERTIFICATIONS / SIGNATURES

"I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I authorize the Department to enter the property that is the subject of this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein. I am aware there are significant penalities for submitting false information, including the possibility of fine and imprisonment."

Signed: Lee Allen **Title** Project Manager **Date:** 3.19.07

Notice of Intent to Comply with Maine Construction General Permit	**With this Site Law application form and my signature, I am filing notice of my intent to carry out work which meets the requirements of the Maine Construction General Permit (MCGP). I have read and will comply with all of the MCGP standards.** **If this form is not being signed by the landowner or lessee of the property, attach documentation showing authorization to sign.** **Signed** Lee Allen **Date:** 3.19.07

NOTE: You must file a MCGP Notice of Termination (Form K) within 20 days of completing permanent stabilization of the project site.

CERTIFICATION

The person responsible for preparing this application and/or attaching pertinent site and design information hereto, by signing below, certifies that the application for development approval is complete and accurate to the best of his/her knowledge.

Signature: Lee Allen

Name (print): Lee Allen

Date: 3.19.07

Re/Cert/Lic No.: 9218

Engineer X

Geologist _____

Soil Scientist _____

Land Surveyor _____

Site Evaluator _____

Active Member of the Maine Bar _____

Professional Landscape Architect _____

Other _____

VIL_RESP03552

SECTION 7

WILDLIFE AND FISHERIES

The State of Maine Department of Inland Fisheries and Wildlife (IF&W) has been contacted regarding the presence of any essential, significant or special concern habitat located on the property. The attached letter from James Pellerin of the Maine Department of Inland Fisheries and Wildlife states that no threatened/endangered fish species or habitats are known to be present on site. Attached, please find a copy of the correspondence with IF&W.

IF&W has requested the addition of a buffer along the Presumpscot River. Therefore, a meeting was held on site with Marybeth Richardson of the Maine Department of Environmental Protection (DEP) and James Pellerin of Inland Fisheries and Wildlife (IF&W) to discuss project alternatives. At their request, the proposed site layout has been revised to include a shore restoration along the Presumpscot River. The revised layout has been forwarded to IF&W for feedback, and the initial feedback has been positive. Attached, please find email correspondence from IF&W regarding the re-design.

The applicant will be restoring a significant portion of the riverbank. The project includes the removal of the concrete mill foundation wall that currently forms the edge of the river. The wall will be replaced with natural riverbank vegetation. This riverbank restoration will reduce the potential for river warming and therefore will improve the environment for the river's fish and wildlife.

Maine Department of Inland
Fisheries and Wildlife
358 Shaker Road
Gray, Maine 04039

Telephone: 207-657-2345 ext.111
Fax: 207-657-2980
Email: james.pellerin @state.me.us

John Elias Baldacci, Governor

Roland Martin, Commissioner

January 17, 2006

Lee Allen
Northeast Civil Solutions, Inc.
153 U.S. Route 1
Scarborough, Maine 04074

RE: Village at Little Falls, South Windham, ME

Dear Lee Allen,

I have reviewed your request for fishery resource information, and there are no known threatened/endangered fish species or habitat in the vicinity of the proposed project. However, the Presumpscot River is located immediately adjacent to the proposed development. The river supports a variety of coldwater and warmwater fisheries, as well as, nongame fish populations. On 1/16/06 I walked the site and also noticed 2 drainage/stream channels that may have further implications for your project depending on how MDEP classifies these water courses.

Stream systems are vulnerable to environmental impacts associated with increased development and encroachment. This project should be sensitive to these resource issues by including provisions for riparian buffers and minimizing any other potential stream impacts. Our regional buffer policy requests 100 foot undisturbed buffers along both sides of any stream or stream-associated wetlands. Buffers should be measured from the upland wetland edge of stream-associated wetlands, and if the natural vegetation has been previously altered then restoration may be warranted. This buffer requirement improves erosion/sedimentation problems; reduces thermal impacts; maintains water quality; supplies leaf litter and woody debris for the system; and provides valuable wildlife habitat. Protection of these important riparian functions insures that the overall health of the stream habitat is maintained. In regards to this particular project, I believe the site plans should be altered to provide a 100-foot buffer for the entire site and some of the buffers areas would need to be restored with native vegetation, particularly in the area of the old mill site. Friends of the Presumpscot River recently acquired a significant grant for these types projects and may be able to assist buffer restoration.

I have forwarded your information requests to our wildlife division and they will be responding separately. If you have any additional questions or concerns then feel free to contact us.

Sincerely,

James Pellerin
Fishery Biologist
MDIFW

CC: MDEP Linda Kokemuller

Lee Allen

From: Pellerin, James [James.Pellerin@maine.gov]
Sent: Wednesday, January 24, 2007 4:21 PM
To: Richardson, Marybeth
Cc: Etzel, Steve; Lee Allen
Subject: RE: Village at Little Falls

Marybeth -

1) I have reviewed the revised plan for the project and it appears much better than the original in terms of providing adequate buffers for the Presumpscot River. A few areas, two of the buildings and one of the entrance roads falls within the preferred buffer, but MDIFW could probably accept this given the larger buffers provided elsewhere on the project site and the associated environmental benefits of cleaning up the old mill.

2) I also assume the applicant will put together a plan for the stream bank alterations associated with the old mill, as well as, a stream buffer restoration plan for previously disturbed areas of the project site.

3) Although much of the land is owned by Sappi, the applicant/town should investigate the possibility of restoring some native tree and shrub species between the river and the entrance drive from Rte. 202. Friends of the Presumpscot may be able to assist with some of the restoration costs, and MDOT may be able to contribute to some plantings adjacent to the Rte. 202 bridge abutment where they removed some rather large trees during their recent bridge replacement project. I will contact MDOT to see what they can do.

3)MDEP will still need to determine the "status" of the small stream, and how this effects the project. Again, from an MDIFW perspective it is not a high value stream and there is likely some validity to the fact that it may be nothing more than a manmade drainage channel that has become somewhat naturalized.

4) Lastly, how is storm water going to be handled?

Keep in touch.

-----Original Message-----
From: Lee Allen [mailto:lee.allen@northeastcivilsolutions.com]
Sent: Wednesday, January 24, 2007 2:14 PM
To: Pellerin, James
Cc: Etzel, Steve
Subject: RE: Village at Little Falls

Jim,
Just checking in to make sure you have everything that you needed from us. We are hoping that you will be able to get back to us before Friday afternoon with any comments on the latest concept. What you are not seeing and what we will eventually design is new riverbank where the mill is currently. Thanks.

Lee Allen, P.E.
Northeast Civil Solutions, Inc.
153 US Route 1
Scarborough, ME 04074

Phone: (207) 883-1000
Toll Free: (800) 882-2227
Fax: (207) 883-1001

-----Original Message-----
From: Pellerin, James [mailto:James.Pellerin@maine.gov]
Sent: Tuesday, January 23, 2007 3:35 PM
To: Lee Allen; Richardson, Marybeth; Etzel, Steve; Lewis, Renee

VIL_RESP03557

Cc: Cameron, Denise
Subject: RE: Village at Little Falls

e -

A few questions...can you label the top of bank, denote scale, and attach a copy of the original. Thanks.

-----Original Message-----
From: Lee Allen [mailto:lee.allen@northeastcivilsolutions.com]
Sent: Tuesday, January 23, 2007 3:25 PM
To: Pellerin, James; Richardson, Marybeth; Etzel, Steve; Lewis, Renee
Cc: Cameron, Denise
Subject: Village at Little Falls

Marybeth and Jim,

Thank you for meeting with us at the Keddy Mill site yesterday. Sorry for the delay but as you will see we made some signifcant revisions to the plan. Attached please find a .pdf of the revised site layout. We would appreicate any comments you might have and are anxious to hear the results of your internal meeting to discuss the channel and the revised plan. Thanks and we look forward to hearing from you soon.

Lee Allen, P.E.
Northeast Civil Solutions, Inc.
153 US Route 1
Scarborough, ME 04074

Phone: (207) 883-1000
Toll Free: (800) 882-2227
Fax: (207) 883-1001

Lee Allen

From: Pellerin, James [James.Pellerin@maine.gov]
Sent: Wednesday, March 14, 2007 12:28 PM
To: Lee Allen
Cc: Richardson, Marybeth
Subject: RE: Village at Little Falls, Windham, ME

Lee -

As discussed on site, we typically request a 100-foot undisturbed buffer adjacent to any stream resource and will in some cases also request buffer restoration if has been previously eliminated or impaired. Since the old mill building is being removed, we discussed restoring at least a 100' buffer along the northern/eastern bank of the river in the vicinity of the sharp bend and downstream to the area where the site is naturally vegetated. Restoration should involve removal of the mill building and its associated debris, as well as plantings with native plants similar what already exists on the undisturbed areas of the bank (i.e. hemlocks, etc.). The planting plan is not expected to recreate an "instant" forest; however, other than the plantings to area should be left undisturbed to naturally revert back to undisturbed area over time. In addition, we had spoken of provided a smaller buffer area between the entrance road and the river on land owned by Sappi. Again, I would expect some plantings of native tree and/or shrub species and then just letting the area revert back to a natural state with no moving or routine disturbances. As discussed, I spoke with MDOT and they are going to look into providing some plantings in the area of the temporary bridge placement, and the applicant would be expected to restore the remaining segment. I think this about covers it, but I suspect a buffer restoration/planting plan will be produced for a final review by MDEP and MDIFW. Let me know if you have any additional questions or concerns..

-----Original Message-----
From: Lee Allen [mailto:lee.allen@northeastcivilsolutions.com]
Sent: Friday, March 09, 2007 1:24 PM
To: Pellerin, James
Subject: Village at Little Falls, Windham, ME

Jim,
We are moving along with our design of the Village at Little Falls and our submission of Site Location Permit to DEP. Could you summarize in a letter to me your expectations of the riverbank stabilization/restoration. I think I have a good handle on what you expect but it would be great to get in writing so that everyone is on the same page. Please feel free to call me with any questions. Thanks.

Lee Allen, P.E.
Northeast Civil Solutions, Inc.
153 US Route 1
Scarborough, ME 04074

Phone: (207) 883-1000
Toll Free: (800) 882-2227
Fax: (207) 883-1001

VIL_RESP03559

Lee Allen

'om: Pellerin, James [James.Pellerin@maine.gov]
.t: Thursday, March 15, 2007 9:21 AM
To: Lee Allen
Cc: Richardson, Marybeth
Subject: RE: Village at Little Falls

Lee -

Based on the sketch, I think we're on the same page and it just didn't come across in my earlier e-mail. Essentially I expect the 100'foot buffer to begin in the area of the bend and continue downstream to where the site becomes naturally wooded again, as well as some restoration of variable width (as noted on the drawing) upstream of the bend. Hope this helps.

-----Original Message-----
From: Lee Allen [mailto:lee.allen@northeastcivilsolutions.com]
Sent: Wednesday, March 14, 2007 1:11 PM
To: Pellerin, James
Subject: Village at LIttle Falls

Jim,
Attached please find a .pdf of our latest grading plan. I am concerned over the desire for a 100 ft buffer along the north eastern shore of the river. Our site plan that we sent to you in January indicated a 50 foot setback from the river to the home. Once we get around the bend of the river we expand the buffer to 100 feet. So please review the plan and let me know if we are on the same page. Thanks.

e Allen, P.E.
Northeast Civil Solutions, Inc.
153 US Route 1
Scarborough, ME 04074

Phone: (207) 883-1000
Toll Free: (800) 882-2227
Fax: (207) 883-1001

VIL_RESP03560

SECTION 8

HISTORIC SITES

The Maine Historic Preservation Commission (MHPC) has been contacted regarding the development's potential impact on historic sites. The MHPC has requested a Phase II archaeological survey of the area. Attached, please find a copy of the correspondence with MHPC. A MHPC approved archeologist will perform this survey in the spring of 2007. The results of the survey will be forwarded to MHPC and the DEP for further review.

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

JOHN ELIAS BALDACCI
GOVERNOR

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

December 19, 2005

Lee Allen, P.E.
Northeast Civil Solutions
153 U.S. Route 1
Scarborough, ME 04074

Project: MHPC #3091-05 - proposed Village at Little Falls; Route 202, S. Windham
Town: Windham, ME

Dear Mr. Allen:

In response to your recent request, I have reviewed the information received November 29, 2005 to initiate consultation on the above referenced project pursuant to Maine's Site Location of Development Law.

Based on the location and scope of work, I have concluded that the proposed development, in particular the southerly (downstream) extension of row housing (southernmost 13 units) may have a direct or indirect impact on archaeological site 8.20, a National Register eligible Archaic and Ceramic period site discovered and tested during hydroelectric relicensing studies. The limits of archaeological site 8.20 have not been determined so far. The enclosed graphics show (in red) archaeological excavation units on site 8.20, and an approximation of the proposed downstream limits of the Little Falls Village construction area.

Additional information on direct and indirect impacts that could result from the proposed undertaking, including stormwater drainage and proposed riverbank access, will be necessary. Further archaeological testing (Phase II) of the area of direct impact at the downstream end of the proposed project will also be necessary to determine whether site 8.20 extends into that area. Please contact Dr. Arthur Spiess, Senior Archaeologist of the Maine Historic Preservation Commission, for further information.

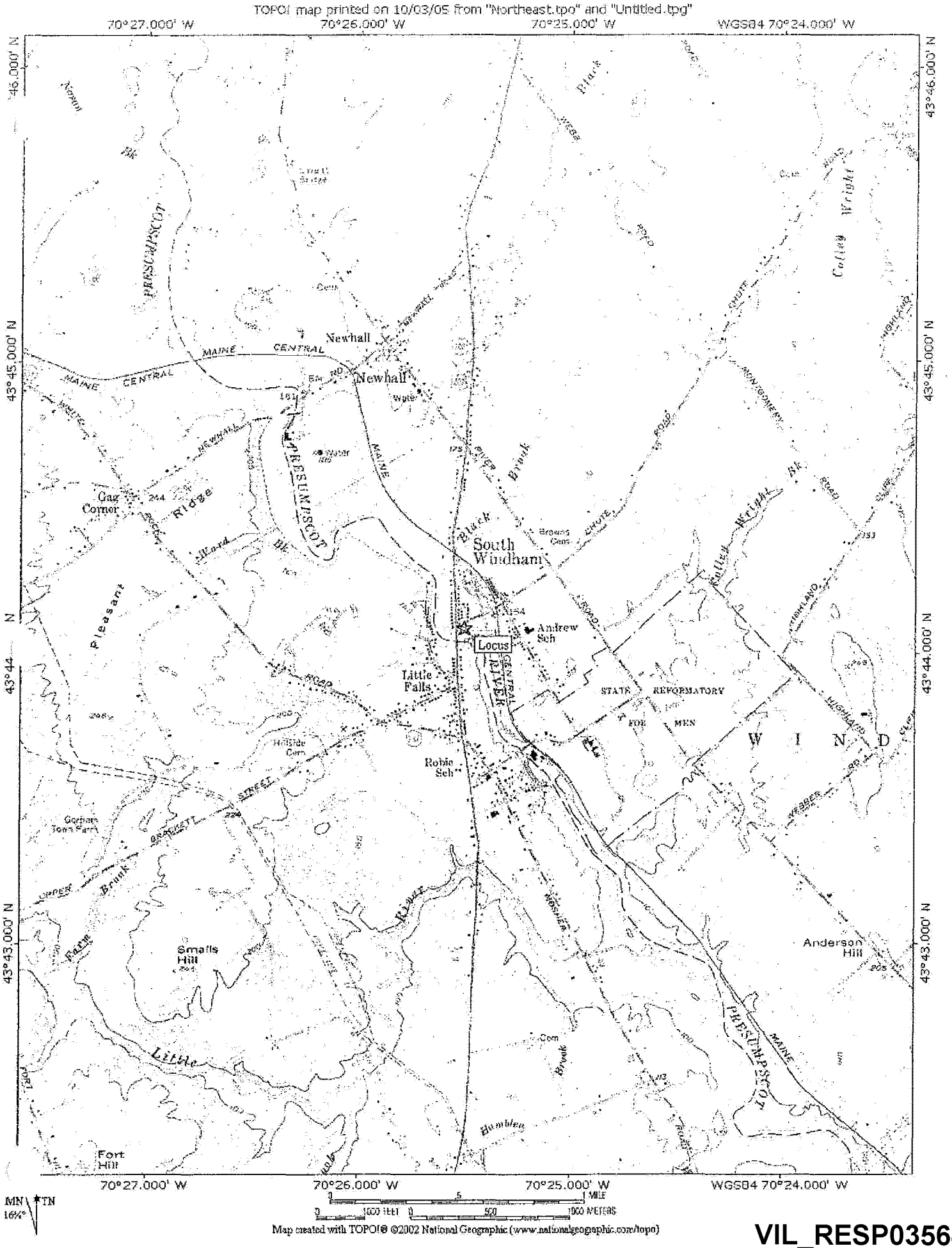
A list of qualified archaeologists is enclosed along with material explaining the Phase I/II/III approach to archaeological survey. This office must approve any proposal for archaeological fieldwork.

Sincerely,

Earle G. Shettleworth, Jr.
State Historic Preservation Officer

RECEIVED
DEC 21 2005

enc:



VIL_RESP03564

VIL_RESP03565

Avenue de Paris

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

ANGUS S. KING, JR.
GOVERNOR

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

CONTRACT ARCHAEOLOGY GUIDELINES

June 10, 2002

This document is provided as background information to agencies, corporations, professional consultants or individuals needing contract archaeological services (also known as Cultural Resources Management archaeology) in Maine. These guidelines are based on state rules (94-089 Chapter 812).

Finding an Archaeologist

At the time that MHPC issues a letter requiring archaeological survey work, MHPC will also supply one (or more) lists of archaeologists (Levels 1 and/or 2, historic or prehistoric) appropriate to the type of work (Phase I, II, III, historic or prehistoric). **Archaeologists on the Level 2 Approved Lists can do projects of any level, including Phase I archaeological survey projects.** Level 1 archaeologists are restricted to doing Phase I surveys, and certain planning projects for municipal governments.

MHPC maintains lists of archaeologists interested in working in different geographic areas of Maine, and those who are qualified in different types of work. The archaeologists themselves indicate their availability (except for short-term absence) to MHPC on a periodic basis, so archaeologists on the list can be expected to respond to inquiries. The applicant should solicit proposals or bids for work from archaeologists whose names appear on the list supplied by MHPC.

These archaeologists' names are taken from lists of archaeologists approved for work in Maine by MHPC under a set of rules establishing minimal qualifications, such as previous supervisory experience in northern New England, and an appropriate graduate degree. *However, the inclusion of an archaeologist on one of these lists should not be interpreted as an endorsement by the MHPC beyond these limited qualification criteria. Moreover, the MHPC cannot recommend the services of an individual archaeologist.*

Project Types

The vast majority of contract archaeology survey work falls into one of three categories. **Phase I** surveys are designed to determine whether or not archaeological sites exist on a particular piece of land. Such work involves checking records of previous archaeology in the area, walking over the landscape to inspect land forms and look for surface exposures of soil and possible archaeological material, and the excavation of shovel test pits in areas of high probability.

Phase II surveys are designed to focus on one or more sites that are already known to exist, find site limits by digging test pits, and determine site content and preservation. Information from Phase II survey work is used by the Maine Historic Preservation Commission (MHPC) to determine site significance (eligibility for listing in the National Register of Historic Places). **Phase III** archaeological work, often called data recovery, is careful excavation of a significant archaeological site to recover the artifacts and information it contains in advance of construction or other disturbance.

PHONE: (207) 287-2132

FAX: (207) 287-2335

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

JOHN ELIAS BALDACCI
GOVERNOR

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

Prehistoric Archeologists Approved List: Review and Compliance Consulting/Contracting (Active)
August 18, 2005

LEVEL 1

Ms. Edna Feighner (207/879-9496)
N. H.Division of Historical Resources
Box 2043
Concord, N. H. 03302-2043
Efeighner@NHCHR.state.nh.us

Mr. Michael Brigham (207/778-7012)
Archaeology Research Center
University of Maine at Farmington
139 Quebec Street
Farmington, Me. 04938
brigham@maine.edu

Mr. Brian Valimont (207/251-9467)
New England Archaeology Co., LLC
117 Cat Mousam Road
Kennebunk, Me. 04043
newarch1@verizon.net

Rebecca Cole-Will (207/288-3519)
Abbe Museum
PO Box 286 (26 Mt. Desert Street)
Bar Harbor, Me. 04609-0286
(207/667-4055)
curator@abbemuseum.org

Richard P. Corey (207/778-7012)
P. O. Box 68
East Wilton, Me. 04234-0068
rcorey@maine.edu

James A. Clark (207/667-4055)
TRC/Northeast cultural resources
71 Oak Street
Ellsworth, Me. 04605
clark@midcoast.com

Edward Kitson (207/778-7012)
Archaeology Research Center
University of Maine at Farmington
139 Quebec Street
Farmington, Me. 04938
kitson@maine.edu

LEVEL 2

Dr. Richard Will (207/667-4055)
TRC/Northeast Cultural Resources
71 Oak Street
Ellsworth, Me. 04605
FAX: 207/667-0485
willarc@acadia.net

Dr. Ellen Cowie (207/778-7012)
Archaeology Research Center
University of Maine at Farmington
139 Quebec Street
Farmington, Me. 04938-1507
ecowie@maine.edu

Dr. Bruce J. Bourque (207/287-3909)
Maine State Museum
83 State House Station
Augusta, Me. 04333-0083
bbourque@abacus.bates.edu

Dr. Nathan Hamilton (207/780-5324)
Dept. of Geography & Anthropology
University of Southern Maine
Gorham, Me. 04038

Dr. Steven L. Cox (207/287-3909)
Maine State Museum
83 State House Station
Augusta, Me. 04333-0083
steven.cox@state.me.us

Dr. Jonathan Lothrop (412/856-6400)
GAI Consultants
570 Beatty Road
Monroeville, Pa. 15146
j.lothrop@gaiconsultants.com

Robert N. Bartone
Archaeology Research Center
University of Maine at Farmington
Farmington, Me. 04938
b_bartone@maine.edu

Dr. Leslie Shaw (207/725-3815)
Dept. of Sociology & Anthropology
Bowdoin College
Brunswick, Me. 04011
e-mail: lshaw@bowdoin.edu

Dr. William R. Belcher
U.S. Army CILHI
310 Worchester Avenue, Building 45
Hickam AFB, Hi. 96853-5530
wbelcher@msn.com

Geraldine Baldwin (914/271-0897)
John Milner Associates, Inc.
1 Croton Point Ave., Ste B
Croton-on-Hudson, N. Y. 10520
FAX: 914/271-0898
GeraldineBaldwin@aol.com

Dr. Stuart Eldridge (207/879-9496)
Northern Ecological Associates
451 Presumpscot Street
Portland, Me. 04103
seldridge@neamaine.com

Dr. Victoria Bunker (603/776-4306)
P. O. Box 16
New Durham, N. H. 03809-0016
vbi@worldpath.net

David Putnam (207/762-5078)
47 Hilltop Road
Chapman, Me. 04757
qaavik@ainop.com
putnamd@umpi.maine.edu

Deborah Wilson (563-1383)
374 Bayview Road
Nobleboro, Me. 04555
dwil@gwi.net

Edward Moore
TRC/Northeast Cultural Resources
71 Oak Street
Ellsworth, Me. 04605
FAX: 207/667-0485

SECTION 9

UNUSUAL NATURAL AREAS

The State of Maine Department of Conservation has been contacted regarding the development's potential impact on any unusual natural areas. Attached, please find a letter from the Department of Conservation stating that no known rare or unique botanical features are present on site.

STATE OF MAINE
DEPARTMENT OF CONSERVATION
157 HOSPITAL STREET
93 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0093

N ELIAS BALDACCI
GOVERNOR

PATRICK K. MCGOWAN
COMMISSIONER

December 12, 2005

Lee Allen, P.E.
Project Manager
Northeast Civil Solutions, Inc.
153 U.S. Route 1
Scarborough, ME 04074

Re: Rare and exemplary botanical features, Village at Little Falls, Windham.

Dear Mr. Allen:

I have searched the Natural Areas Program's digital, manual and map files in response to your request of November 29, 2005 for information on the presence of rare or unique botanical features documented from the vicinity of the project site in the Town of Windham, Maine. Rare and unique botanical features include the habitat of rare, threatened or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to Steve Timpano, Environmental Coordinator, Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat

MAINE NATURAL AREAS PROGRAM
MOLLY DOCHERTY, DIRECTOR

PHONE: (207) 287-8044
FAX: (207) 287-8040
TTY: (207) 287-2213

exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

The Natural Areas Program is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. The Natural Areas Program welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by the Natural Areas Program are to be published in any form, the Program should be informed at the outset and credited as the source.

The Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $75.00 for our services.

Thank you for using the Natural Areas Program in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,

Toni Bingel Pied

Toni Bingel Pied
GIS Specialist/Assistant Ecologist
93 State House Station
Augusta, ME 04333-0093
207-287-8044
toni.pied@maine.gov

Enclosures

SECTION 10

BUFFERS

A vegetative buffer is proposed along the Presumpscot River. The site and grading plans included in the attached plan set provides the dimension and location of the proposed buffer. After the removal of the existing mill, a significant portion of the riverbank will need to be revegetated. The planting specifications and details for the proposed buffer is included in the attached landscape plans. The buffer will be owned and maintained by the condominium owners association.

SECTION 11

SOILS

The soil boundaries taken from the Cumberland County SCS Soil Maps show the following soils being encountered on the site:

Cu – Undorthents – Hydrologic Soil Group C
HrB – Hollis Fine Sandy Loam – Hydrologic Soil Group C
Py – Podunk Fine Sandy Loam – Hydrologic Soil Group B
HfD2 – Hartland Very Fine Sandy Loam – Hydrologic Soil Group B
Sn – Scantic Silt Loam – Hydrologic Soil Group D

The boundaries of the soil areas are shown on the attached Pre-Development and Post-Development drainage plans.

The applicant requests that the Class B High Intensity Soil Survey be waived for this application. The proposed project does not include stormwater infiltration or on-site subsurface disposal. In addition, the site has been previously developed, so the majority of the site would be classified as urban fill. Therefore, a geotechnical investigation would provide more relevant information than the Soil Survey. Attached, please find a copy of the geotechnical investigation report form Paul DeStefano, PH.D., P.E. of Oak Engineers. Please refer to the test pit logs in the attached Geotechnical Report for a detailed description of the soils encountered.

The existing wetland area is delineated on the attached existing conditions plan. The small wetland area is the result of a man-made drainage channel. This drainage channel will be filled as a result of the development. The stormwater from the channel will be redirected into the proposed catch basin network.

OAK
ENGINEERS
Civil Engineers & Land Surveyors

February 27, 2007 Project 064006

Lee D. Allen, P.E.
Northeast Civil Solutions
153 U.S. Route 1
Scarborough, Maine 04074

RE: Geotechnical Investigation
Village at Little Falls, LLC
7 to 13 Depot Street
South Windham, Maine

Dear Mr. Allen:

Oak Engineers, LLC (Oak) has completed a geotechnical investigation of the above site in accordance with our agreement entitled *Geotechnical and Structural Engineering Services* authorized on January 3, 2007. The purpose of this investigation is to provide geotechnical design recommendations related to the proposed construction at the above location (the Site).

PROJECT REQUIREMENTS

We understand that the existing Site will be developed into a multi-unit condominium development. According to proposed site *Grading and Drainage Plan* by Northeast Civil Solutions (Site Engineer) dated February 16, 2007, the development will consist of twenty-five, one- and two-story, wood-framed residential structures, two 12-unit, three-story apartment buildings with at-grade accessed parking underneath, and associated access roads and driveways as depicted in Figure 2 of Attachment A.

The existing topography consists of rolling terrain and previously developed land. According to the proposed grading plans, a maximum of approximately 20 feet of fill and 15 feet of earth cut will be required to level the site beneath the proposed buildings and pavements. Based on revised planes, we understand that the existing site structures and building will be completely demolished and disposed off site. The Maine Department of Inland Fisheries and Wildlife has required that the proposed development restore the riverbank along the Presumpscot River upon demolition of the existing mill building. In accordance with this requirements, the riverbank area is to be reconstructed to a slope with maximum grades of 2H:1V. The toe of slope will be stabilized with riprap, while the remainder of slope will be stabilized through a series of vegetative techniques recommended by the US Army Corp of Engineers (ACE) when stabilizing riverbanks. Additionally, a permanent earth retaining wall extending as much as 26 feet above adjacent grades will be required adjacent to the existing power plant and river.

According to the site *Grading and Drainage Plan* and conversations with the site engineer's office, the proposed storm water system will be a watertight underground storage system composed of 5-foot diameter pipes located at station 51+00 right, between the proposed homes and the Presumpscot River.

Brown's Wharf • Newburyport, MA 01950
T: 978.465.9877 • F: 978.465.2986
400 Commercial Street • Suite 404 • Portland, ME 04101
T: 207.772.2004 • F: 207.772.3248
www.oakengineers.com

Based on our understanding of the proposed construction, maximum anticipated foundation loads are estimated as follows:

1. Interior Columns = 80,000 pounds
2. Exterior Columns = 60,000 pounds
3. Load Bearing Walls = 2,000 pounds/foot
4. Floor Slabs = 50 pounds per square foot (psf) or 3,000 pound concentrated load

Maximum total and differential building foundation settlement tolerable is assumed to be one inch and one-half inch respectively.

DESCRIPTION OF SITE AND GEOLOGY

The Site is approximately 8.0-acre in area and located on the south side of Depot Street in South Windham, Maine. A Site Location Plan is shown on Figure 1. The Site is currently developed with an abandoned, three-story, concrete and masonry, mill building bordering the north and east banks of a bend in the Presumpscot River. The building is approximately 60,000 square feet in plan area and abuts an existing power plant structure associated with the adjacent Little Falls dam. Three, one-story, wood-framed buildings are also located on the northeast corner of the proposed development.

Existing site grades decrease to the south and east, towards the abutting Presumpscot River. Based on Northeast Civil Solutions (Site Engineer) site plans, grade elevations range by approximately 40 feet across the Site, with the highest elevations of 132 feet (NGVD 29) located near Depot Street on the northeast corner of the property and the lowest site elevations of 92 feet being located along the banks of the Presumpscot River. A Subsurface Exploration Plan depicting the proposed construction along with existing site topography is shown as Plan C1 in Attachment A. Final building and site grades are currently under development.

According to information provided by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) website, soils in the vicinity of the Site are predominantly cut and fill land (approximately 83 percent of site area) and smaller areas of Hollis series soils (9.4 percent) and Scantic series soils (5.2 percent). Hollis series soil consist of shallow, well drained granular soils formed in a thin mantle of till derived mainly from gneiss, schist, and granite. The Scantic series soils consist of very deep, poorly drained soils formed in glaciomarine or glaciolacustrine deposits on coastal lowlands and river valleys.

Based on a review of *Surficial Geology Map of the Gorham Quadrangle, Maine* (Smith et al, 1999), regional surficial soils likely consist of massive to laminated gray and blue-gray silt and silty clay of the Presumpscot Formation. This soil deposit is variable in thickness from less than 1 meter to more than 50 meters. According to *Bedrock Geology of the Portland 1:100,000 Quadrangle, Maine and New Hampshire,* (Berry, Hussey, et al, 1998), bedrock underlying the Site likely consists of flaggy, bluish to purplish-gray, biotite-quartz-plagioclase granofels of the Hutchins Corner schist formation.

SCOPE OF INVESTIGATION

Subsurface Exploration

In general, subsurface exploration methods consisted of field test pit excavations and soil test drilling. Eighteen test borings (B101 through B118) were advanced with 3¼-inch inside diameter (i.d.) hollow-stem steel augers, at the approximate locations indicated on the attached plan included as Attachment A, to a maximum depth of 32 feet below the ground surface (bgs). Soil samples were obtained from each test boring with split-barrel spoon samplers at continuous and nominal 5-foot intervals as directed by Oak's geotechnical engineer. Standard penetration resistance tests were performed and recorded at each sampling interval in accordance with ASTM D 1586 procedures. At soil boring B114, a single undisturbed soil sample was extracted from the underlying soil layers using a thin-walled Shelby tube in according to ASTM D 1587 procedures. Two 5-foot NQ rock core samples were collected from B104 and B105, from approximately 3 feet to 8 feet bgs. Both the soil and rock samples were returned with the field drilling logs to Oak's office for further analysis and review. Final soil boring logs were prepared by an engineer on the basis of our visual classification of soil samples, laboratory test results, and field drilling logs and are included as Attachment B.

Additionally, ten test pits (TP101 to TP107; TP109 to TP111) were excavated at the approximate locations indicated on the attached plan included as Attachment A, to a maximum depth of 6.5 feet bgs. Soil samples were reviewed and classified in the field in accordance with ASTM D 2488 Visual-Manual Procedure. Final test pit logs were prepared by an engineer on the basis of our visual classification of soil samples and field test pit logs and are included as Attachment B.

Laboratory Testing

Soil samples were visually classified by a geotechnical engineer in general accordance with ASTM D 2487 Unified Soil Classification System (USCS) in Oak's office. Selected split spoon and Shelby tube soil samples were transported to certified soil testing firm's offices (John Turner Consulting, Inc., of Dover, New Hampshire and Geotesting Express, of Boxboro, Massachusetts) for laboratory analysis and testing. Laboratory testing included sieve analyses, Atterberg limits, and moisture contents for submitted split spoon samples. Additional testing included consolidated undrained (CU) triaxial compressive strength and consolidation testing from Shelby tube samples. All testing was conducted in accordance with accepted ASTM procedures. Complete laboratory analysis and test results are included in Attachment C.

Geotechnical Evaluation

The geotechnical engineer evaluated subsurface conditions relative to the proposed development on the basis of field reconnaissance and subsurface exploration, project description, local geology, and laboratory analysis and testing in accordance with generally accepted geotechnical engineering principles and practices. According to our agreement, the geotechnical engineer evaluated conditions and provided recommendations for the following project elements:

1. Site Preparation
2. Building Foundations

3. Excavation and Dewatering
4. Earth Retaining Structures
5. Underground Utilities and Subsurface Infiltration Systems
6. Floor Slabs on Grade
7. Pavements
8. Fill and Backfill
9. Construction Quality Control

SUBSURFACE CONDITIONS

Soil Test Boring and Test Pit Results

Apparent Subsurface Profiles of the proposed construction and existing topography and interpreted soil profiles are shown as Plan C2 in Attachment A. A summary of ASTM D 2487 soil classifications for samples recovered from all test borings is shown in the table below. A description of each soil classification is defined in Attachment B.

Table 1: Summary of ASTM D 2487 Soil Classifications

Depth (ft.)		B101	B102	B103	B104	B105	B106	B107	B108	B109	B110
From	To										
0	2	SM	SM	SM-ML	SM	SM	ML	ML	ML	SW	ML
2	4	SM	ML	SM-ML	ML	ML	ML	ML			ML
4	6	CL	ML	SM-ML			ML			ML	ML
6	8	CL	ML	SM-ML							
8	10	CL		GM-SM							
10	12	CL		GM-SM							
15	17	CL									
20	22	CL									

Depth (ft.)		B111	B112	B113	B114	B115	B116	B117	B118	B119
From	To									
0	2	SM	SM	GM-SM	SM	SM	SM	SM	SM	SM
2	4	SM		GM-SM	SM	SM	SM	SM	SM	SM
4	6	SM		GM-SM	SM	SM		SM	SM	SM
6	8			GM-SM	SM	SM		SM	SM	ML
8	10			SM	SM	SM		SM	SM	ML
10	12			SM	SM	SM-OL		SM	SM	
15	17			ML	SM	SM		CL		
20	22				CL	CL				
25	27				CL					
30	32				CL					

Soil test boring results were variable across the Site. For the purposes of this report and the related development, the Site is divided into three general areas of similar subsurface profile. The three general areas are shown on drawing C1 in Attachment A and are generally described as follows:

Area 1: property extending to the south along the eastern bank of the Presumpscot River (River bank silty sand and gravel with variable depth to bedrock).

Soil samples from Area 1 generally consisted of silt and fine sand overlaying shallow bedrock. Borings in this area of the property include B104 to B108 and B110 to B112. Auger refusal on apparent bedrock was encountered on this portion of the Site at depths ranging from 1.2 to 6.0 feet bgs. Rock core specimens were obtained from two borings (B104 and B105) in this area of the property.

Area 2: northeastern corner of the property (upland silt over shallow bedrock)

Soil samples from Area 2 generally consisted of olive silt overlaying shallow bedrock. Borings in this area of the Site include B102 and B109 and auger refusal on apparent bedrock was encountered at depths of 7.3 and 7.5 feet bgs, respectively.

Area 3: the central and western portion of the property (lowlands alluvial plain with deep organics and clay).

Soil samples from Area 3 generally consisted of predominantly fine to coarse sand and fine to coarse gravel with trace to some silt. This granular soil stratum often contained concrete, coal ash, and bricks. In borings B113, B114, and B115, these granular soils overlay organic sands and silts with possible river (fluvial) debris, with areas of buried wood and leaves. This organic layer was observed in soil samples from depths of approximately 9 to 18 feet bgs. Underlying the organic soils in this area of the Site was generally a layer of gray to blue gray silty clay and

silt deposits. Auger refusal on apparent bedrock was encountered at depths ranging from 17 to 32 feet bgs.

Rock Core Sampling Results

Two rock core samples were collected in borings B104 and B105 from approximately 3 to 8 feet bgs. The recovered rock core samples were comprised of schist bedrock. The dark gray schist was slightly weathered, but foliated, splitting or cleaving readily. The rock core recovery ratio was near 100 percent for both samples.

A rock quality designation (RQD) was calculated for the retrieved bedrock core specimens. The RQD is used to assess the structural integrity of a rock mass and is defined as the cumulative length of rock core pieces longer than 10 centimeters (cm), divided by the total length of the core run. Based upon the bedrock cores obtained in B104 and B105, the RQD values are 68.3 and 73.3 percent, respectively.

Ground Water

Soil samples were generally moist at all depths. Ground water was neither encountered during drilling nor observed after drilling in any boring in Areas 1 and 2 of the Site. In Area 3 of the Site, groundwater was encountered at depths of 8 to 11 feet bgs in all test boring locations.

Laboratory Test Results

Results of laboratory testing are summarized below, with supporting laboratory results included as Attachment C.

Table 2: Summary of Soils Laboratory Results

	Sample/Depth							
	B101, S4 6–8 ft.	**B102, S3 4–6 ft.**	**B103, S5 8–10 ft.**	**B105, S2 2–4 ft.**	**B113, S2 2–4 ft.**	**B114, S9 25–27 ft.**	**B115, S6 10-12 ft.**	**B117, S2 2-4 ft.**
Gravel (%)	--	--	39.5	--	39.1	--	6.4	32.4
Sand (%)	--	--	40.8	--	54.2	--	54.7	42.1
Silt/Clay (%)	--	--	19.7	--	6.7	--	38.9	25.5
Moisture (%)	27.2	26.2	12.5	24.7	13.3	38.7	52.9	6.1
Organic (%)	--	--	--	--	--	--	5.8	--
Liquid Limit	38	20	--	23	--	22	--	--
Plastic Limit	22	--	--	--	--	20	--	--
USCS	CL	ML	GM-SM	ML	GW-SW	CL	SM	SM

Table 3: Summary of Soils Consolidation and C-U Triaxial Test Results

Depth	Preconsolidation Pressure (P_c)	Compression Index (C_c)	Recompression Index (C_r)	Initial Void Ratio (e_o)	Undrained Shear Strength (S_u)	Coefficient of Consolidation (C_v)
B114, 23-25 ft.	3,600 psf	0.2907	0.0448	0.90	930 psf	6.0×10^{-3} in^2/sec

CONCLUSIONS AND RECOMMENDATIONS

The geotechnical engineer interpreted subsurface conditions with respect to the proposed construction on the basis of field exploration, laboratory analysis, and visual classification of soil samples. Design parameters and construction recommendations are provided below according to an analysis of subsurface conditions disclosed by this investigation and accepted geotechnical engineering principles.

In general, the Site is considered suitable for the proposed construction. In Areas 1 and 2 of the Site, native granular or silt soils and underlying bedrock are expected to provide an adequate bearing stratum for shallow foundations and the assumed design loads However, due to proposed significant grade increases and existing subsurface conditions, Area 3 of the Site is considered unsuitable for foundations bearing on conventional spread footings due to compressibility of the underlying silty clay and organics under the proposed fill and building loads. Significant settlement of the existing underlying organic soils and relatively deep compressible clay soils are anticipated due to the depth and area of fill necessary to achieve final site grades. Although primary consolidation settlements are expected to dissipate within a relatively short period of time after placement of the fill, long-term settlements due to the presence of organics and secondary compression of the deep clays are expected to continue for a long period of time after construction. Due to the relatively deep clay deposits and high embankments, site utilities in Area 3 should not be installed until primary consolidation settlements are significantly dissipated.

Subsurface Conditions

In Areas 1 and 2 of the site, native overburden soils generally consist of fluvial silty sand (SM) and silt (ML) deposits overlying shallow bedrock. The relative density of soil samples ranged from loose to firm (medium-dense). Native overburden soils in these areas are considered of moderate strength and low compressibility. Depths to bedrock varied from 1.2 to 6.0 feet bgs in Area 1 and 7.3 to 7.5 feet bgs in Area 2. Based on our interpretation of the recovered rock core samples, the native bedrock appears to be foliated schist and is moderately weathered, hard, and massive. Based upon the shallow depths of bedrock it is anticipated that bedrock excavation will be required in those portions of the Site.

In Area 3, overburden soils generally consisted of very loose to loose granular fill soils (SM, GM-SM) over a layer of sandy soils containing wood timbers, wood chips, leaves, and organics to depths of 13 to 18 feet bgs. These deposits overlay soft native Presumpscot silty clay deposits to depths of 18 to 33 feet bgs. The organic fill and soft clay soils are considered to be of low to moderate strength and compressibility. Permanent ground water levels are anticipated to be well below the proposed excavation levels for building foundations and utilities on site. However, the proposed retaining wall adjacent to the

on-site power plant will require foundations that extend below groundwater and the adjacent river and dewatering will be required for installation of foundations.

For the purposes of seismic design, the soil profile on the property is classified as Site Class B (Areas 1 and 2) or E (Area 3) according to *Minimum Design Loads for Buildings and Other Structures* (ASCE 7-02) published by American Society of Civil Engineers (ASCE).

Site Preparation

Site preparation should commence by re-locating underground utilities and demolishing all structures within the footprint of the proposed onsite construction. All existing underground utilities located beneath the proposed foundations should be relocated to outside building perimeters. Underground structures beneath the proposed buildings or pavements should be removed to at least 2 feet below proposed foundation and pavement subgrade levels, and 2 feet below finished grades in landscaped areas. The basement area of the existing building should be filled to subgrade level. The surficial soils should then be stripped of all pavements, topsoil, and organics within the proposed building and pavements.

After clearing and stripping the site, subgrades beneath the proposed buildings, pavements, and fill areas should be proof-rolled with several passes of a 15-ton vibratory roller traveling at slow speeds in each perpendicular direction. All weak and unstable subgrades observed by pumping and weaving during proof-rolling or resulting in depressions greater than one-half of an inch after several passes of the roller should be undercut a minimum of 12 inches and backfilled.

According to the schematic site plans, a relatively large volume of fill will be required to level site grades in beneath the proposed building, roads and parking areas in Area 3 of the property. Up to 20 feet of fill will be required to achieve the proposed site grades for the building and parking lot construction. Site grades throughout the property should be increased with imported Fill material as specified herein. Underground utilities and final pavements in Area 3 of the property should be installed outside the building perimeters only after final site grade elevations are established and settlements have substantially dissipated. Detailed requirements for placement of fill and backfill are provided in the following paragraphs.

In Area 3, primary consolidation of the underlying clay soils are estimated to occur over a period of approximately 3 to 5 months after construction of the fill. In order to accelerate the time to dissipate settlements beneath the fill, we recommend that the site be pre-loaded with additional fill. According to our analysis, a pre-loading program consisting of placement of an additional 5 to 7 feet of fill and installation of prefabricated vertical wick drains will accelerate the time to reach anticipated total settlement of the fill and enable construction of pavements and utilities to continue in normal fashion within approximately 1 to 2 months after placement of the pre-load. In order to achieve uniform settlement over the entire construction area, the additional pre-load fill should be placed over an area 10 feet larger in each direction, where possible, than the proposed final grades and sloped according to the recommendations provided herein.

We estimate a substantial amount of pre-load fill soil will be required in Area 3. However, the pre-load material should be reused in embankment and retaining wall fill areas in other portions of the Site, which will reduce the cost of the pre-loading program. It should be noted that due to the presence of significant deep subsurface organics, pre-loading is recommended for dissipating settlements beneath pavements,

embankments, and utilities and does not render spread footings a viable foundation option in this area of the property.

Preloading will require a subgrade settlement monitoring program within the proposed construction area during and after construction of the fill and preload in order to determine the actual rate of settlement and projected time for settlements to dissipate. The program should be conducted under the supervision of a geotechnical engineer licensed in Maine.

Excavation and Dewatering

All excavations should be performed according to OSHA Standards (29 CFR 1926 Subpart P). Temporary un-braced excavations completely within the silty fine sand granular layers (OSHA Type C) should be cut no steeper than one and a half horizontal to one vertical (1.5H:1V or 34°) under dry conditions, to a maximum depth of 12 feet.

In Areas 1 and 2 of the Site, where bedrock may be encountered, the bedrock should be undercut a minimum of 12 inches below proposed retaining wall foundation or pad, pavements, bottom of utility, or building subgrade levels and backfilled with structural fill. Based on this investigation, we believe that bedrock encountered on the site will likely require either pre-drilling and splitting or blasting to loosen the bedrock. If blasting is selected as the preferred means of rock excavation, we recommend that a pre-blast survey of all structures and utilities within at least 100 yards of the blast site be conducted. Peak particle velocity of soils adjacent to critical structures and utilities should be monitored and limited to less than 1 inch per second throughout blasting. Blasting should be conducted by certified/licensed blasting firms with at least 10 years of experience demonstrating rock blasting in residential and commercial zones.

Upon encountering bedrock during excavation for footings, basement slabs, or utilities, the earthwork contractor should expose that portion of the bedrock surface that may require blasting. An independent surveyor should provide an elevation survey of the exposed rock surface and the Contractor, Owner, and Engineers should mutually agree upon the quantity of rock excavation prior to commencing with drilling and blasting operations.

Given the nature of shallow bedrock blasting techniques and the resulting conical blast radii, it is generally not feasible to produce a flat, level blasted subgrade with no quantities of overblasted materials. In order to prevent cost over runs and to provide a Contractor incentive for limiting quantities of overblast, we recommend that a pay limit line be set for each area of rock excavation, below which the Contractor is not entitled to additional compensation. The pay limit line should be fixed at 1.0 foot below proposed design subgrades. The lateral pay limit line should be fixed at 2 feet outside of foundations and utility pipelines.

Excavations adjacent to existing structures or property should be properly shored to prevent shifting and/or settlement of these structures or off-site grades. Underpinning existing foundations is recommended for any excavation that extends below and is within a horizontal distance equal to 1.5 times the cut below adjacent foundation subgrades. Shoring and underpinning, if required, should be designed by a professional engineer licensed in Maine.

Surface runoff should be directed away from excavations to minimize dewatering and to protect subgrades from becoming soft and unstable. Any water entering these excavations should be immediately

removed from foundation subgrades using sump and pump techniques. Excavation side slopes should be monitored for potential seepage and maintained accordingly.

Foundations

In Areas 1 and 2 of the Site, the soils at proposed foundation grades are considered to be generally of low compressibility and moderate strength, and therefore conventional shallow spread foundations are recommended for building column support. All foundations exposed to exterior or unheated spaces should be placed a minimum of 4.5 feet below the adjacent finished site grades or slabs to provide for adequate frost protection. All interior foundations surrounded by heated spaces should be placed a minimum of 2 feet below floor slabs to provide for adequate bearing capacity. Exposed foundation subgrades should be densified with several passes of a hand operated vibratory roller or heavy plate compactor. Any weak subgrades observed by pumping and weaving beneath the compactor should be undercut a minimum of 8 inches and backfilled with structural fill. Bedrock encountered within foundation subgrades should be undercut a minimum of 12 inches and backfield with structural fill to final footing grades. Final foundation subgrades should be free of all loose rock, soil, water, frost, or other deleterious materials.

Spread foundations supported on properly prepared subgrades may be proportioned for a maximum allowable net bearing pressure of 4,000 pounds per square foot (psf). They should have a minimum horizontal dimension of 3 feet, even if this results in a bearing pressure less than the maximum allowable. Continuous wall foundations should be at least 2 feet wide and otherwise proportioned for a maximum net allowable bearing pressure of 3,500 psf. Maximum total column foundation settlement is estimated to be 1 inch. Settlements should occur immediately after placement of each load increment. Maximum differential settlement is expected to be less than ½ inch.

In Area 3 of the Site, the underlying organic and silt soils are considered to be generally of low to moderate compressibility and strength. Immediate (short-term) settlements due to the placement of 15 to 20 feet of fill on the site are expected to be 3 to 5 inches. Based on our interpretation of subsurface conditions, additional long-term settlements caused by the fill placement and secondary compression of the underlying soils may result in intolerable settlements beneath shallow building foundations. Therefore, conventional shallow spread foundations are not recommended in Area 3.

Considering the subsurface conditions and feasible foundation alternatives, we believe the proposed buildings in Area 3 of the Site should be supported on deep foundations extending to a firm bearing stratum beneath the organic soils and clay layer. Deep foundations should extend to the underlying sound bedrock, which may range from approximately 15 to 30 feet below proposed foundations. Drilled piers would most likely require permanent casing to maintain stable excavations during installation and are not recommended due to their relatively high associated costs.

Economically feasible deep foundation options considered for this site are driven timber, pre-cast concrete and steel piles. Timber piles are considered to be the most economical for this site given the anticipated foundation loads, depth of suitable bearing stratum, and subsurface conditions. Accordingly, Oak recommends that the buildings in Area 3 be supported on timber piles driven to refusal on sound bedrock. Pre-drilling may be required to penetrate through subsurface obstructions if driving stresses exceed the recommended values.